

Analysis of the Impact of the Qaliwarma Program on the Academic Performance of Students in Primary Schools in San Roman Province, Puno, Peru

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Abstract

The research work had the general objective of analyzing the impact of the Qali Warma Program on the quality of life of students in primary educational institutions in the province of San Roman, the quantitative approach of non-experimental design was used, the study population and sample consisted of 80 parents of primary educational institutions in the province of San Roman, the results revealed that the satisfaction of students with the food provided by the program is neutral, with 56.25% of parents perceiving it this way, 33.75% not very satisfied and only 10% very satisfied, likewise there is an increase in the number of approved students making a difference of 1336 students between the periods 2016 - 2023, and a reduction of disapproved students of 84, as a final conclusion it was determined that the Qali Warma Program has a moderate impact on the quality of life and academic performance of primary students in San Roman, with a majority of parents who perceive the program in a neutral way. However, the program has demonstrated success in improving academic performance and increasing the number of beneficiaries, contributing to the development of skills and progress in reading comprehension and mathematics.

Keywords: Feeding, Education, Academic Performance, Qali Warma National School Feeding Program.

Introduction

The World Health Organization (WHO) has emphasized the importance of a balanced and adequate diet in the overall development of children. Good nutrition is closely linked to the physical growth, cognitive development and academic performance of students. Studies have shown that a diet deficient in essential nutrients can negatively affect students' learning ability, concentration and memory, which in turn can impact their academic performance and their ability to reach their full potential (Smith et al., 2020; Johnson & Smith, 2019; Brown, 2018). The Peruvian province of San Roman faces high rates of poverty and malnutrition, which negatively impacts children's academic development. Elementary school face challenges such as lack of resources and support. The Peruvian government launched the Qaliwarma program to provide nutritious food in schools.

According to the National Institute of Statistics and Informatics (INEI), by the first half of 2023, chronic child malnutrition (CBN) reached 11.1% nationwide, with a higher prevalence in rural areas (21%), which is three times higher than in urban areas (7.5%). These levels were reached after many decades of work. According to the World Health Organization, chronic child malnutrition in the Puno region in 2022 was 11.65%, which is close to the national average according to INEI (2022). According to the 2017 National Household Survey (ENAHO), school non-attendance in rural areas is 7.4% for children aged 6 to 11 years, while in urban areas it is 9.1%. These figures are higher than in 2007, where non-attendance was 6.9% in rural areas and 6.3% in urban areas. This shows that the problem of school absenteeism is worsening.

For Ariza and Rojas (2020) investigated in Colombia the impact of the School Feeding Program of the Ministry of National Education on the academic performance of eleventh grade students in Ibagué in 2018.

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They used data from Simat, Saber 11 tests and propensity score matching technique. At the national level, no significant effect was observed in reading, mathematics and English, but improvements in attendance and dropout reduction were observed. Acosta and Robles (2017) investigated in Guayas how nutrition impacts the academic performance of fifth grade students. They found a relationship between nutrition and school performance. Likewise, in a study conducted in Argentina by Jofré et. al. (2007), the importance of adequate nutrition at school breakfast and its impact on nutrition and cognitive performance of students was analyzed. The results indicated that students who do not eat adequately at breakfast have deficiencies in their nutritional status, as well as significant differences in the ability to process information during classes.

According to Rampersaud et al. (2005), School Feeding Programs in the U.S. and Europe improve academic performance by reducing feelings of hunger. A balanced breakfast with carbohydrates, proteins and fats provides increased energy and improves students' cognitive function, which translates into better grades and attendance. Healthy eating benefits students' health and well-being, improving the school environment. A study in Mexico by Vega and Iñarritu (2000), highlights the importance of breakfast in the physical growth of students. The lack of an adequate breakfast can affect intellectual and educational processes, especially in those with marginal malnutrition. Yaranga (2023) analyzed the relationship between the food provided by the National School Feeding Program Qali Warma and the educational performance of children in the Educational Institution "Carlos Laborde" in 2021. It was found that 56% of the students reached the expected level in reading comprehension, 52% in mathematics. Only 2 students excelled in both areas, demonstrating a significant connection between Qali Warma food and academic performance.

Also Rupey (2022), the educational approach of the National School Feeding Program Qali Warma promotes healthy eating habits among beneficiaries through training, technical advice and educational materials. The skills of technical teams, School Feeding Committees and Purchasing Committees are strengthened to ensure efficient management. In addition, standardized strategies are used to promote healthy eating and hygiene practices. Salazar (2022) investigated the influence of the Qali Warma National School Feeding Program on the nutritional status and academic performance of primary school students in Quilcas in 2021. He used an applied study with correlational and cross-sectional design, surveying 214 parents from 6 primary schools. The results of the Spearman analysis showed that Qali Warma has a direct and significant correlation with nutritional status, but a weak correlation with academic performance.

According to Velásquez (2022) investigated the factors that influence school performance of second and third grade children in the Educational Institution 10796 Carlos Augusto Salaverry. Interviews with parents, teachers and principals were used, as well as academic performances. The study included 131 students and an econometric least squares model was used to analyze socioeconomic, family and academic variables. The results showed that class attendance and internet access were significant variables affecting performance in Communication, Mathematics and Science and Technology. The study by Jamanca (2021) evaluated the impact of the Qali Warma program on the educational performance of children at the Educational Institution N°86039 in Huaraz in 2018. No significant differences were found in grade levels in language and mathematics between children who received program benefits and those who did not. There were no notable differences in attendance, grade promotion, risk of repetition or school dropout. On the other hand, Solis (2019) investigated the impact of the Qali Warma program on the comprehensive development of students at the Educational Institution 86154 Quishuar - Ancash in 2019. Qualitative and quantitative approaches were used, with a descriptive correlational design. The population included 20 teachers. The results showed a significant correlation ($r=0.753$) between the Qali Warma program and the comprehensive development of students. It was concluded that there is a relationship between the food component of the program and the integral development of students, with a significant impact. The objectives of the research were achieved.

According to Quichua (2018), in his study on the "Impact of the Qali Warma program on the comprehensive development of students in educational institutions in Pueblo Nuevo-Ica, 2018 the program has a positive and significant impact on the comprehensive development of students in educational institutions in Pueblo Nuevo-Ica. This is reflected in the Rho Spearman correlation coefficient of $r = 0.791$ and a significance level of 0.000 lower than the critical region 0.05. On the other hand, Sachún (2019) in

his study on the positive impact of the Qali Warma food service on the school performance of primary school students in the Province of Pacasmayo notes that with the start of operations of Qali Warma, a significant increase in the number of beneficiaries and schools receiving the food service was observed, which resulted in a significant improvement in the academic performance of primary school students in the province.

Materials and Methods

The quantitative approach uses data collection and analysis to answer research questions, test hypotheses and establish patterns of behavior in a population. It seeks to generalize results from one group to a larger population and allow replication of studies (Hernández et al., 2014). It is a non-experimental research in which it is performed without deliberately manipulating variables and in which only phenomena are observed in their natural environment and then analyzed. These are studies where we do not intentionally vary the dependent variables on other variables and this research is of transectional design since it collects data at a single point in time. The research design is descriptive, the characteristics of the phenomenon are already known and what is sought is to expose its presence in a given human group. In the quantitative process, central tendency and dispersion data analysis are applied. In this scope it is possible, but not obligatory, to propose a hypothesis that seeks to characterize the phenomenon of the study.

Population

According to Hernández, Fernández and Baptista, cited by Castañeda (2018) “the population is the set of all cases that agree with a series of specifications the populations must be clearly situated around their characteristics of content, place and in time”. The population is made up of the parents of primary institutions of the Provincial Municipality of San Roman.

Sample

For the quantitative process, the sample is a subgroup of the population from which data are collected and must be representative of it. A population is the set of all cases that agree with a series of specifications (Selltiz, 1980 cited by Hernández Sampieri, 2010). The sample is a subgroup of the population of interest on which data will be collected, and which has to be precisely defined and delimited beforehand (Hernández, Fernández, and Baptista 2014).

The sample is made up of 80 parents from the Province of San Román The selection of the type of sampling will be stratified probability sampling, because the magnitude of the error in the predictions can be measured with a margin of error of 5% and a confidence level of 95% (Hernández et al. 2014).

Collection of Data

The population to be studied is located in the educational facilities of the province of San Roman. According to López and Fachelli (2015) the survey is a “data collection technique through the interrogation of subjects whose purpose is to systematically obtain measures on the concepts derived from a previously constructed research problem”. Whose technique is the survey.

As an instrument we applied the questionnaire. The questionnaire is an “instrument of data collection (measurement) and the protocol form of asking questions (registration table) that is administered to the population or an extensive sample of it through an interview where the anonymity of the subject is characteristic” (López and Fachelli, 2015).

Results and Discussion

Table 1. Number of students benefiting from the Qaliwarma program according to those enrolled in the province of San Roman.

Table 1. Public Institutions Benefiting at The Primary Level

YEAR	N° OF PUBLIC INSTITUTIONS BENEFITING AT THE PRIMARY LEVEL	N° OF BENEFICIARY STUDENTS
2016	410	36 228
2017	403	37 825
2018	410	38 317
2019	408	39 132
2020	399	41 848
2021	399	39 471
2022	407	38 801
2023	407	39 334

Source: INFOMIDIS, 2023

Table 1 shows that the Qaliwarma program in San Roman province has seen the number of beneficiaries grow between 2016 and 2020, from 36,228 to 41,848. This indicates an increase in the effectiveness of the educational benefit program. However, starting in 2021, the number of beneficiaries decreased to 39,471, remaining constant in 2022 and 2023. This decrease may be influenced by factors such as the COVID-19 pandemic or student demographics. The number of beneficiaries has shown greater variability, suggesting that fluctuations in the number of beneficiaries are not directly related to changes in the number of institutions. This aligns with the evolution of the number of institutions and users receiving food services, with the highest number in 2017 representing a 181% increase since 2013 (Sachún, 2019).

Table 2. Quality Of Life Results of The Students of The Educational Institutions of San Roman.

Levels	Frequency	Percentage	Percentage valid	Accumulated percentage
Low Satisfaction	7	8,8	8,8	8,8
Neutral	39	48,8	48,8	57,5
Very Satisfied	31	38,8	38,8	96,3
Fully Satisfied	3	3,8	3,8	100,0

Source: Parents Of the Educational Institutions of San Roman. Elaborated Based on The Survey (2024).

Table 2 shows that the Qali Warma program, as perceived by parents in the Province of San Roman, is in the neutral range. It is observed that under the perception of parents, 48.8% of the total, consider that the food has a neutral impact. Likewise, it is observed that 38.8% are very satisfied with the Qaliwarma program. Also, only 8.8% indicate that they are not very satisfied with the program. Finally, it is worth mentioning that scales of totally satisfied 3.8% of the total were used.

Results - D. Feeding

Table 3. Feeding Results of The Educational Institutions in The Province of San Román

		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	1.00	0	0	0	0
	2.00	27	33.75	33.75	33.75

	3.00	45	56.25	56.25	90
	4.00	8	10.0	10.0	100
	5.00	0	0	0	
	Total	80	100	100	

Source: Parents of the educational institutions of San Roman. Based on the survey (2024).

Table 3 shows that the Qali Warma program, as perceived by parents in the Province of San Roman, is in the regular range. It is observed that under the perception of parents, satisfaction is 56.25% of the total, considering that the food has a neutral impact. Likewise, it is observed that 33.75% are not very satisfied with the Qaliwarma program. Finally, it is worth mentioning that scales of not at all satisfied and totally satisfied were used, where no parent surveyed responded in this way, being 0% of the total.

Table 4. Academic Performance Results of Elementary School Students in San Roman Province.

Academic Performance					
		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	2,00	5	6,3	6,3	6,3
	3,00	65	81,3	81,3	87,5
	4,00	10	12,5	12,5	100,0
	Total	80	100,0	100,0	

Source: Parents of the educational institutions of San Roman. Based on the survey (2024).

Table 4 shows that the National School Feeding Program Qali Warma perceived by parents in the Province of San Roman, that 6.25% of the total sample consider that academic performance is within level 2 (little satisfied), 81.25% of the total sample consider that academic performance is within level 3 (neutral) which has greater representativeness and finally 12.50% of the total sample consider that academic performance is within level 4 (Very satisfied). Asqui (2019) demonstrated a significant relationship between nutritional status and academic performance in children from I.E.P. N°70076 “Cajas Reales”. In comparison, in San Roman, 81.25% of parents perceive academic performance as neutral under the Qali Warma program, with only 12.5% very satisfied and 6.25% not very satisfied, suggesting a limited impact.

Table 5. Results Of Opinion on The Qaliwarma Program

		Frequency	Percentage	Percentage valid	Accumulated percentage
Valid	2.00	11	13,8	13,8	13,8
	3.00	53	66,3	66,3	80,0
	4.00	15	18,8	18,0	98,8
	5.00	1	1,2	1,3	100,0
	Total	80	100	100	

Source: Parents of the educational institutions of San Roman. Based on the survey (2024)

Table 5 of “Opinion about the program” shows that the majority of parents (66.3%) rate the Qaliwarma program with a 3.00, indicating a moderate perception. Some 18.8% of parents gave a rating of 4.00, suggesting a positive assessment, while 13.8% gave a rating of 2.00, reflecting a negative opinion. Only 1.3% rated the program a 5.00, indicating a very favorable perception.

Results - Academic Performance

D1: Qualifications

Table 6. EBR-Primary: Passed, Failed and Withdrawn 2016 - 2018

Concept	Public Management	
	2016	2018
Total Primary	24,401	25,737
Approved	24,150	25,622
Disapproved	170	86
Withdrawn	81	29
First Grade	4,446	3,670
Approved	4428	3662
Disapproved	0	0
Withdrawn	18	8
Second Grade	4,354	3,709
Approved	4,288	3,672
Disapproved	52	33
Withdrawn	14	4
Third Grade	4,111	3,867
Approved	4,049	3,836
Disapproved	49	24
Withdrawn	13	7
Fourth Grade	3,881	3,963
Approved	3,827	3,938
Disapproved	38	20
Withdrawn	16	5
Fifth Grade	3,549	3,896
Approved	3,518	3,888
Disapproved	20	7
Withdrawn	11	7
Sixth Grade	4,060	3,632
Approved	4,040	3,626
Disapproved	11	2
Withdrawn	9	4

Source: Ministry of Education - Educational Census.

Table 6 shows the academic performance in terms of grades, an increase of 1472 students passed during the period 2016-2018 was observed. In addition, there was a decrease in the number of disapproved students, with a difference of 84 students. These results coincide with what was mentioned by Velasquez (2022), who highlighted an increase of 59.55% in the pass rate of students, a decrease of 54.55% in the

disapproval rate. These findings demonstrate that the Qali Warma program has a positive impact on education by ensuring that the human capital invested by parents and the state is favorable for students. This contributes to improving academic performance and ensuring more favorable results in terms of grades.

D2: Skills

Table 7. Mathematics Results, San Roman Provincial School Olympiad, Primary, (Opemc 2020-2023)

Year	Total Students	Participating Students	Students Classified to Final Phase	Percentage of Participation %	Percentage of Classification%
2020	31 040	650	138	2.09%	21.23%
2021	30 503	672	147	2.20%	21.87%
2022	29 897	822	188	2.74%	22,87%
2023	29 053	845	199	2.90%	23,55%

Source: UGEL SAN ROMÁN (OPEMC 2020-2023).

Table 7 shows the results obtained in student participation in the Math Olympiad where it shows us a gradual increase from 2.09% in 2020 to 2.90% in 2023, indicating a growing interest and/or better access to the competition. The percentage of students who qualified to the final phase also shows a slight upward trend, from 21.23% in 2020 to 23.55% in 2023, suggesting an improvement in students' academic performance and skills. The results of (OPEMC) in the province of San Roman show a positive trend in Mathematics, suggesting that the educational efforts and initiatives of programs such as Qali Warma may be contributing to improving the academic performance and skills of students.

Table 8 Communication Results, San Roman Provincial School Olympiad, Elementary, (OPEMC 2020-2023).

Year	Total Students	Participating Students	Students Classified to Final Phase	Percentage of Participation %	Percentage of Classification %
2020	31 040	649	122	2,09%	18,79%
2021	30 503	680	141	2,22%	20,73%
2022	29 897	710	155	2,37%	21,83%
2023	29 053	760	167	2,61%	21,97%

Source: UGEL SAN ROMÁN (OPEMC 2020-2023).

Table 8 shows the results obtained in student participation in the Communication Olympiad has been consistent, although with a gradual increase in the percentage of participation from 2.09% in 2020 to 2.61% in 2023. The percentage of students who qualified to the final phase has shown a positive trend, increasing from 18.2% in 2020 to 21.97% in 2023, which may indicate an improvement in students' reading comprehension skills. The results of (OPEMC) in the province of San Roman show a positive trend in Communication, this suggests that educational efforts and initiatives of programs such as Qali Warma may be contributing to improve the academic performance and skills of students. Regarding Skills, the active participation of students from the province of San Roman in the OPEMC (Provincial School Olympics of Mathematics and Communication) was visualized, obtaining outstanding and positive results. These results are consistent with what Quichua (2018) indicated that the impact of the Qali Warma program has a significant influence of 65.57% in the comprehensive development (Skills) of students.

D3: Knowledge

Table 9. ECE Reading Scores in Two Different Years, 2016 And 2018

Year	Prior to start	In start	In process	Satisfactory	Average measurement
2016	6,5%	25,7%	36,8%	31,0%	489
2018	5,4%	20,3%	31,8%	42,5%	501
	-1,1%	-5,4%	-5%	+11,5%	

Source: MINISTRY OF EDUCATION - Educational Census

In comparative table 9 between 2016 and 2018, we can observe a decrease in the level of knowledge in reading “prior to start”, in 2016, 6.5% of students were in this stage, while in 2018, this percentage decreased to 5.4%, there is a decrease of 1.1%, in the “in beginning” stage in 2016, 25.7% of students were in this stage, while in 2018, this percentage decreased to 20.3%, “in process” in 2016, 36.8% of students were in this stage, while in 2018, this percentage decreased to 31.8%, in the “satisfactory” stage in 2016, 31,0% of students were in this stage, while in 2018, this percentage increased to 42.5%, in general the data suggests that there was a decrease in the percentages of students in the initial stages of the program (pre-start and in startup), while there was an increase in the percentages of students in the later stages (in process and satisfactory)

Table 10. ECE Mathematics Results in Two Different Years, 2016 And 2018

Year	Prior to start	In start	In process	Satisfactory	Average measurement
2016	5,0%	18,9%	44,1%	32,0%	491
2018	4,3%	13,4%	42,1%	40,3%	507
	-0,7%	-5,5%	-2%	+8,3%	

Source: MINISTRY OF EDUCATION - Educational Census

In the comparative table 10 between 2016 and 2018, we can observe a decrease in the level of knowledge in “prior to start”, in 2016, 5% of the students were in this stage, while in 2018, this percentage decreased to 4.3%, there is a decrease of 0.7%, in the stage of “in start” in 2016, 18.9% of the students were in this stage, while in 2018, this percentage decreased to 13.4%, “in process” in 2016, 44.1% of students were in this stage, while in 2018, this percentage decreased to 42.1%, in the “satisfactory” stage in 2016, 32.0% of students were in this stage, while in 2018, this percentage increased to 43.0%, overall the data suggests that there was a decrease in the percentages of students in the initial stages of the program (pre-startup and in startup), while there was an increase in the percentages of students in the later stages (in process and satisfactory).

In the area of Knowledge, a decrease of 1.1% was observed in the "prior to the start" stage and an increase of 11.5% in the "satisfactory" stage in the ECE - reading comprehension during the period 2016 - 2018, likewise a decrease of 0.7% of the stage in "prior to the start" and an increase of 8.3% of the "satisfactory" stage in the ECE - Mathematics of the period 2016 - 2018 can be observed. These results show that there is a significant relationship between the National School Feeding Program Qali Warma and reading comprehension - mathematics. These results coincide with a study conducted by Yaranga (2023), which indicates a direct and significant relationship between the Food Endowment of the Qali Warma program and the level of learning of reading comprehension; level of learning of mathematics in the Carlos Laborde Educational Institution; in relation to reading comprehension more than 50% of schoolchildren understand

what they read on a scale of "satisfactory" achievement and 31% are with a learning in "satisfactory" achievement

The study analyzed the impact of the Qali Warma Program on the quality of life of students in primary educational institutions in the Province of San Roman. The results revealed that student satisfaction with the food provided by the program is neutral, with 56.25% of parents perceiving it this way, 33.75% not very satisfied and only 10% very satisfied. According to Maqui (2015), the program has had a positive effect on reducing child malnutrition by providing essential nutrients. Likewise, there is an increase in the number of approved students making a difference of 1336 students between the periods 2016 - 2018, and a reduction of disapproved students of 84, with this result it was determined that the Qaliwarma program has generated a positive impact. This result coincides with what was indicated by Ochoa (2015), that the approval of students increased by 1.5%, and in disapproved decreased by 4.6%, and in recovery increased by 3.1%. Likewise, the Qali Warma program contributes to education by making the human capital invested by parents and the state adequate and favorable for students.

Overall, the Qali Warma National School Feeding Program has proven to be an effective intervention in multiple dimensions of student development. The increase in the number of beneficiaries, improvement in academic performance, skills development and progress in reading comprehension and mathematics reflect the program's success in meeting its objectives. These findings underscore the importance of maintaining and expanding school feeding programs such as Qali Warma, not only as a measure to combat child malnutrition, but also as a key tool to improve the academic performance and overall development of students

Conclusions

Overall, the Qali Warma Program has a moderate impact on the quality of life and academic performance of primary school students in San Roman, with a majority of parents perceiving the program as neutral. However, the program has demonstrated success in improving academic performance and increasing the number of beneficiaries, contributing to the development of skills and progress in reading comprehension and mathematics. This underscores the importance and effectiveness of the program in the integral development of the students, although there is still room for improvement in overall perception and satisfaction.

The Qali Warma Program has a moderate impact on the quality of life of primary school students in San Roman. Most parents perceive the program neutrally (48.8%), with 38.8% very satisfied and 8.8% dissatisfied. In food, 56.25% have a neutral perception, while 81.25% of parents consider academic performance related to food perception to be neutral. Overall, the program receives a moderate rating (3.00) for overall satisfaction, with room for improvement.

The Qali Warma National School Feeding Program has proven to be successful in several aspects of student development. An increase in the number of beneficiaries, an improvement in academic performance, the development of skills and progress in reading comprehension and mathematics have been observed. These results highlight the importance and effectiveness of the program in achieving its objectives. It is evident that school feeding programs such as Qali Warma play a crucial role in improving academic performance and the integral development of students.

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