








Correlation Near Point of Convergence and Amplitude Accommodation with School Myopia Progression at Near Activity in Badung Regency

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Abstract

AIM: The aim is to know the correlation between Near Point of Convergence (NPC) and Amplitude Accommodation (AA) with school myopia progression.

METHODS: Study location at Sibang Gede 1st elementary school, Kuta 1st elementary school, Jimbaran 4th elementary school, and Kerobokan Kelod 2nd elementary school. The sample was obtained by convenience sampling, stratified sampling, and consecutive sampling techniques. Data were analyzed and searching for a correlation between NPC, AA, and myopia progression was done by bivariate and multivariate analysis with age, gender, and myopic parent.

RESULTS: This study has 125 samples who mostly female 56 %, age at 7-year-old 24.8%, median near activity 78 Dh/week, myopic parent 27.2%. Correlation NPC showed inversely to progression of myopia (NPC Break $r = -0.332$, $p < 0.001$; NPC Recovery $r = -0.335$, $p < 0.001$). Correlation AA and progression of myopia showed positive correlation (AA Binocular $r = 0.287$, $p = 0.001$; AA RE $r = 0.226$, $p = 0.017$; AA LE $r = 0.261$, $p = 0.07$). Age has correlation with progression of myopia with ($p < 0.05$).

CONCLUSION: There is a correlation between NPC and AA with school myopia progression at near activity in Badung Regency. Smaller NPC was correlated with progression of myopia and higher AA was correlated with progression of myopia, although age was correlated with myopia progression.

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Introduction

Blindness and visual impairment are problems caused by many eye disorders, one of which is a refractive error. Blindness and visual impairment due to refractive errors can be found in children to the elderly, but if it occurs in children and is not handled properly, it will cause a very big problem in the future. Visual disturbances due to uncorrected refractive errors occur in 13 million at the age of 5–15 years and 45 million at the age of 16–49 years [1]. Refractive errors occupy the number 3 cause of blindness in Indonesia at 0.14%. About 10% of the 66 million school children in Indonesia suffer from refractive errors. This condition, if not handled quickly, will result in the emergence of a layer of Indonesian youth who have a low quality of life and intellectuals in the future [2].

Myopia is the most common type of refractive error and in high degrees, it can increase the risk of permanent visual impairment and blindness [3], [4].

School myopia is a term used for myopia that appears and develops in school-age children [5]. The prevalence of myopia in schoolchildren varies based on ethnic and cultural background and location [4]. Based on The Child Heart and Health Study in England in 2010, the prevalence of myopia in Southeast Asia ranks first at 25.2% in school-age children [6]. The prevalence of myopia in school-age children continues to increase significantly worldwide [7].

The causes of school myopia are very complex. Factors causing myopia are caused by a combination and interaction between hereditary (hereditary) and environmental factors [4], [5]. One of the environmental factors that play a role in myopia is near-sight activities such as reading, writing, watching television, using computers, and playing video games [4], [8].

Accommodation, convergence, and pupillary constriction are a triad that occurs when we look at Nearly [9] Convergence and accommodation can be measured by near point of convergence (NPC) and amplitude of accommodation (AA) [10]. NPC is a simple

basic measure that can be done. NPC is the convergence amplitude (punctum proximum convergence) or the nearest point where a person can still maintain fusion and see 1 target [11]. The accommodation amplitude is the maximum amount of accommodation or focusing ability of a person's response when looking up Near.

The relationship between accommodation and convergence has been known for a long time. Morgan, in 1944, stated that the vergence of the eye changes according to accommodation, the accommodation of the eye changes when the vergence changes, there is no relative accommodation, and vergence and positive accommodation are related to negative convergence. Hashemi *et al.* 2017 study found that in schoolchildren aged 6–12 years, high accommodation amplitude values were associated with myopia and inversely proportional to NPC values. The study by Abraham *et al* 2005 found a higher AA in myopia aged 35 and 44 years compared to emmetropia and hypermetropia [12].

Researchers are interested in conduct researching on elementary schools in Badung Regency based on the data that Badung Regency is an advanced urban area due to tourism and strategic location, the existence of the National Development Program, which distributes free laptops to elementary schools, Badung's per capita income exceeds Denpasar city and high school enrollment rates in Badung Regency.

Methods

This study is an analytical observational study with a cross-sectional study approach. Observations (measurements) of the variables studied without intervention were carried out, and then analyzed the relationship between the independent and dependent variables.

This study has received ethical approval from the Udayana University Ethics Committee. To research the population, the researcher has managed and obtained permission from the National and Political Unity of Badung Regency. After getting approval, the researcher went to 4 elementary schools in Badung Regency that had been previously determined, namely Sibang Gede 1st elementary school, Kuta 1st elementary school, Jimbaran 4th elementary school, and Kerobokan Kelod 2nd elementary school. The near activity was measured with the adapted The Sydney Myopia Study Student Questionnaire [13].

The inclusion criteria of this study are age 7–13 years old, has near activity 31 dioptic hours weekly, patients with myopia with spherical equivalent-6 D, cylindrical correction < 0.75 D. The exclusion criteria for this study are the history of wearing glasses before school age, children with Amblyopia, history of trauma

and or previous eye surgery and with strabismus (crossed eyes).

The number of students at Sibang Gede 1st elementary school is 200 students, Kuta 1st elementary school is 465 students, Jimbaran 4th elementary school is 542 students and SD 2 Kerobokan Kelod is 278. Hence, the total number of elementary schools is 1485 students.

Interviews with questionnaires will be conducted with teachers in each elementary school class regarding students' near activities at school. Students in grades 1 to 6 will also be given a near activity questionnaire outside of school hours to take home and be filled out by parents who gave the consent will be collected the next day. Parents will fill out a questionnaire regarding how long the total learning activity was, reading as a hobby, playing with gadgets or computers, and watching television per week and stated in dioptic-hour (Dh) with the formula (3x [study activity + reading as a hobby] + 2x playing games + 1x watching TV). Students' near activities during school hours and outside school hours will be combined and calculated with the criteria that students who have near activities 31 dioptic-hour (Dh) per week will have an eye examination.

The researcher will conduct a visual examination. Visual examination is done to find out whether students suffer from myopia or not. The visual examination room must have adequate lighting, be able to stick a Snellen chart on the wall at a distance of 6 meters, be clean, and safe, and no one will interfere during the examination.

The eye examination is carried out simply and is carried out to ensure that the student does not have a squint or a history of trauma and surgery.

Examination of the anterior segment of the eyeball will be carried out using a flashlight. While examination of the posterior segment using a funduscopy to see the presence of a fundal reflex.

The NPC and AA measurement will be carried out by an ophthalmologist resident who has been trained to use the previous tool. The tool used to measure NPC is the modified RAF Rule or RAF Near Point Rule. NPC measurement using a trial frame with the best correction when looking at a distance placed 15 mm in front of the eye. Patients are measured in a room with normal room lighting or by turning on the light on the target drum if the room light is not bright at the time of measurement.

Measures the NPC break that will be obtained when the sample says that the dot looks shaded to 2 (diplopia) or until the target stops at the check rest. NPC recovery will be obtained when the target is slowed down and the sample sees the black dot becoming one again. The results of NPC break and recovery will be obtained in cm. Measurements were repeated three times then added and divided by 3 [14], [15], [16], [17].

To Measure AA, students use a trial frame with the best correction when looking at a distance which is placed 15 mm in front of the eye and measured monocularly and binocularly. Patients are measured in a room with normal room lighting or by turning on the light on the target drum if the room light is not bright at the time of measurement.

Measures Near Point Accommodation (NPA) which is the last point the word on the target can be seen clearly in cm. AA in Diopters will be obtained from the inverse ratio of NPA in meters. Measurements were repeated three times then added and divided by 3 [10], [15].

Results

The study conducted at 4 Elementary Schools in Badung Regency from July 23–September 8, 2018 found 1485 students from 4 schools, of which only 1118 students whose parents filled out informed consent and were examined. Three students were excluded from this study because of exotropia, 3 students had a history of trauma to the eye and 2 students had eye surgery. This study found 146 students who experienced myopia from mild myopia to high myopia. The prevalence of myopia obtained in this study was 14.7%. The prevalence of myopia with near activity (≥ 31 Dh/week) was found to be 15%.

Myopia in elementary school children studied mostly occurred in 2 eyes, namely bilateral myopia as much as 12.3% and a small portion occurred in 1 eye/unilateral myopia 2.6%. Unilateral myopia in this study was caused by the other eye being emmetropic or having other refractive errors such as astigmatism.

There were 36 students excluded because of amblyopia, of which 16 students had myopia. The prevalence of amblyopia obtained in this study was 3.2%. The prevalence of amblyopia due to myopia was 1.4%.

The characteristics of the participants are shown in Table 1. The sample obtained was 125 students with activities near 31 Dh and myopia and it was found that there were more female students (56%) than boys (44%). The age of the students had $p < 0.001$ so was not normally distributed, the most age was 7 years, namely 28 (24.8%) while the least was 12 years, as many as 2 students (1.6%).

Near activity has $p < 0.001$ with the median value of the Near activity being 78 Dh where the smallest student Near activity value is 40 Dh/week and the largest student Nearest activity value is 214 Dh/week. The students who were sampled were 12 people who had myopia where 10 people used glasses while

Table 1: Characteristics of the participants

Characteristics	n (%)
Gender	
Male	55 (44)
Female	70 (56)
Age	
7	31 (24.8)
8	28 (22.4)
9	21 (16.8)
10	14 (11.2)
11	29 (23.2)
12	2 (1.6)
Near activity (Dh) (median)	78
Minimum	40
Maximum	214
Myopia	
Spectacle	10 (8.0)
Contact lens	2 (1.6)
Myopia parents	
Yes	34 (27.2)
No	91 (72.8)
Primary school	
Sibang Gede 1st elementary school	13 (10.4)
Kuta 1st elementary school	25 (20.0)
Jimbaran 4th elementary school	52 (41.6)
Kerobokan Kelod 2nd elementary school	35 (28.0)
Grade	
1 st	19 (15.2)
2 nd	16 (12.8)
3 rd	24 (19.2)
4 th	23 (18.4)
5 th	13 (10.4)
6 th	30 (24.0)

Dh: Dioptic hour.

2 people used contact lenses. Students whose parents have myopia were as many as 34 (27.2%).

125 students who had activity near 31 Dh/week were measured using the RAF Rule and obtained NPC Break, NPC Recovery, AA in the right eye (RE), AA in the left eye (LE), and AA binoculars. Bivariate and multivariate analyzes were performed to find the relationship between each measurement on myopia.

The relationship between NPC break and the size of myopia

The relationship between NPC Break and myopia size was carried out by bivariate analysis and obtained a $p < 0.001$ and correlation coefficient or $r = -0.332$ which means there is a relationship between NPC Break and myopia size where the larger the size of myopia, the smaller the NPC Break.

The equation obtained is $\text{Myopia} = 2.108 - 0.217 \times \text{NPCBreak}$. The p-value obtained from the analysis of variance (ANOVA) test is < 0.001 , so the equation is declared feasible to use.

Figure 1 shows the relationship between NPC Break and Myopia Size has a negative relationship, namely the larger the myopia size, the smaller the NPC Break. Scatter plots are mostly on diagonal lines.

The relationship between NPC Break and Myopia Size after multivariate analysis and adjusted for age, sex, and parents with myopia obtained that the largest Myopia Size was significantly associated with NPC Break (B-0.226: $p < 0.001$). The analysis is described in Table 2.

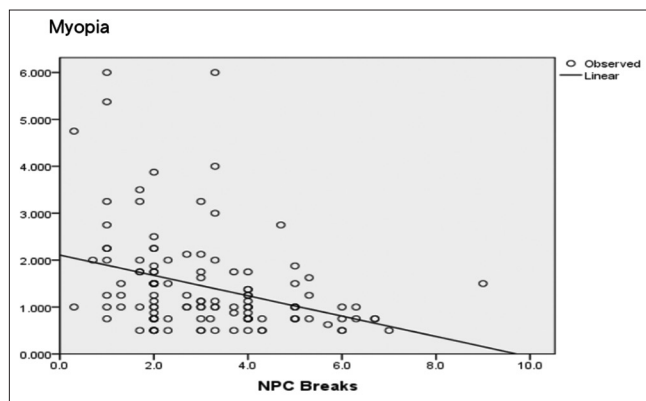


Figure 1: Scatter plot the relationship between near point of convergence break and myopia size

The relationship between NPC recovery and the size of myopia

The relationship between NPC Recovery and myopia size was carried out by bivariate analysis and obtained a p < 0.001 and a correlation coefficient of r = -0.335, which means there is a relationship between NPC Recovery and myopia size where the larger the myopia size, the smaller the NPC recovery.

Table 2: Relationship between size of myopia with near point of convergence break, age, gender, and parents with myopia

Parameter	B	SE	t	p	95% CI	
					Bottom	Above
NPC break	-0.226	0.056	-4.057	0.000	-0.336	0.121
Age	0.109	0.059	1.838	0.069	-0.008	0.027
Gender	-0.212	0.187	-1.136	0.258	-0.581	0.011
Myopia parents	-0.270	0.204	-1.321	0.189	-0.674	0.014

SE: Standard error, CI: Confidence interval, NPC: Near point of convergence.

The equation obtained is Myopia = 2.403 - 0.210 x NPC Recovery. The p-value obtained from the ANOVA test is <0.001 so this equation is declared feasible to use.

Figure 2 shows the relationship between NPC Recovery and Myopia Size has a negative relationship, namely the larger the myopia size, the smaller the NPC Recovery. Scatter plots are mostly on diagonal lines.

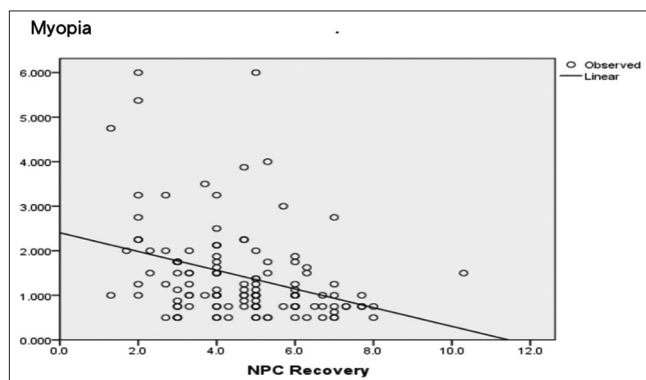


Figure 2: Scatter plot the relationship between near point of convergence recovery and myopia size

The relationship between NPC Recovery and Myopia Size after multivariate analysis and adjusted for age, sex, and parents with myopia obtained that the largest Myopia Size was significantly associated with

NPC Recovery (B-0.227; p < 0.001). Age also affects the size of myopia (B 0.132; p = 0.028). The analysis is described in Table 3.

Table 3: Relationship between size of myopia with near point of convergence recovery, age, gender, and parents with myopia

Parameter	B	SE	t	p	95% CI	
					Bottom	Above
NPC recovery	-0.227	0.053	-4.260	0.000	-0.332	-0.121
Age	0.132	0.059	2.231	0.028	0.015	0.249
Gender	-0.221	0.185	-1.193	0.235	-0.588	0.146
Myopia parent	-0.252	0.202	-1.244	0.216	-0.652	0.149

SE: Standard error, CI: Confidence interval, NPC: Near point of convergence.

The relationship between binocular AA and the size of myopia

The relationship between binocular AA and myopia size was carried out by bivariate analysis and obtained p = 0.001 and correlation coefficient or r = 0.287, which means there is a relationship between binocular AA and myopia size where the greater the size of myopia, the greater the binocular AA.

The equation obtained is Myopia = 0.467 + 0.053 x AA Binocular. The p-value obtained from the ANOVA test is = 0.001, so this equation is declared feasible to use.

Figure 3 shows the relationship between Binocular AA and Myopia Size has a positive relationship, namely the greater the myopia size, the greater the Binocular AA. Scatter plots are mostly on diagonal lines.

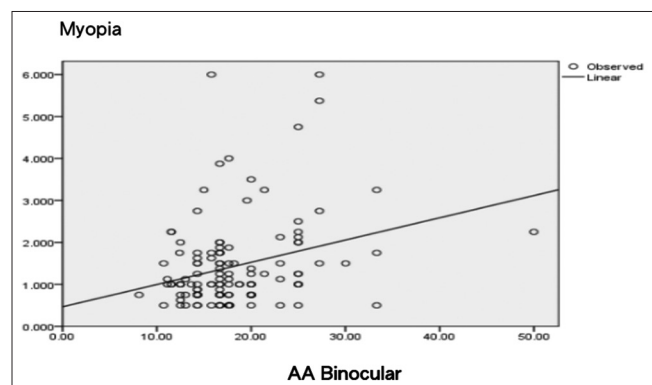


Figure 3: Scatter plot of the relationship between binocular amplitude accommodation and myopia size

The relationship between binocular AA and myopia size after multivariate analysis and adjusted for age, sex, and parents with myopia obtained the largest myopia size was significantly associated with binocular AA (B 0.055; p = 0.001). Age also affects the size of myopia (B 0.128; p = 0.036). The analysis is described in Table 4.

The relationship between AA RE and RE myopia size (RE).

The relationship between AA OD and OD myopia size was carried out by bivariate analysis and obtained p = 0.017 and correlation coefficient or r = 0.226 which means there is a relationship between AA OD and

Table 4: The relationship between the size of myopia with binocular amplitude accommodation, age, gender, and parents with myopia

Parameter	B	SE	t	p	95% CI	
					Bottom	Above
AA binocular	0.055	0.016	3.486	0.001	0.024	0.087
Age	0.128	0.060	2.214	0.036	0.009	0.248
Gender	-0.259	0.189	-1.368	0.174	-0.633	0.116
Myopia parent	-0.116	0.206	-0.563	0.574	-0.523	0.292

AA: Amplitude accommodation, SE: Standard error, CI: Confidence interval.

OD myopia size where the greater the size of myopia OD, the greater the AA OD.

The equation obtained is Myopia OD = 0.666 + 0.041 × AA OD. The p-value obtained from the ANOVA test is = 0.017, so this equation is declared feasible to use.

Figure 4 shows the relationship between AA OD and Myopia Size OD has a positive relationship, namely the greater the size of myopia OD, the greater the AA OD. Scatter plots are mostly on diagonal lines.

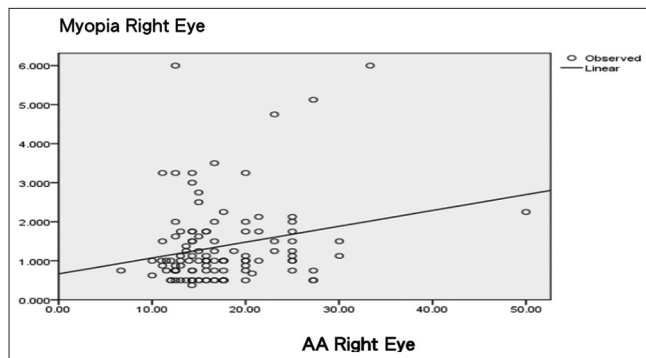


Figure 4: Scatter plot relationship between amplitude accommodation right eye and myopia size right eye

The relationship between AA OD and Myopia Measures OD after multivariate analysis and adjusted for age, sex, and parents with myopia obtained Myopia OD size was significantly associated with AA OD (B 0.048; p = 0.005) (Table 5). Age also affects the size of myopia OD (B 0.146; p = 0.025).

The relationship between AA LE and the size of myopia LE

The relationship between AA OS and myopia OS size was carried out by bivariate analysis and obtained p = 0.007 and correlation coefficient or r = 0.261, which means there is a relationship between AA OS and myopia OS size where the larger the size of myopia OS, the greater the AA OS.

The equation obtained is Myopia OS = 0.556 + 0.041 x AA OS. The p-value obtained from the ANOVA test is = 0.007 so this equation is declared feasible to use.

Figure 5 shows the relationship between AA OS and OS Myopia Size has a positive relationship, namely the greater the size of the myopia OS, the greater the AA OS. Scatter plots are mostly on diagonal lines.

The relationship between AA OS and Myopia OS Size after multivariate analysis and adjusted for

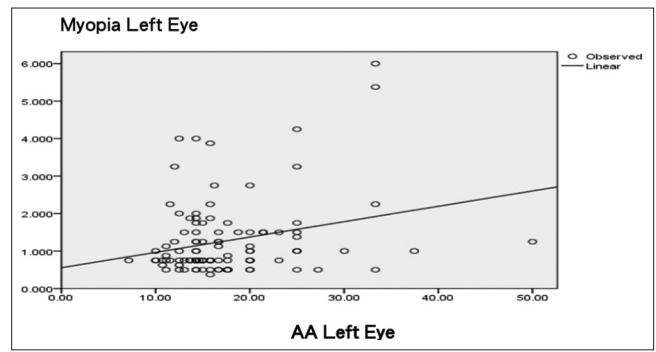


Figure 5: Scatter plot relationship between amplitude accommodation left eye and OS myopia size on the left eye

age, sex, and parents with myopia obtained Myopia OS Size was significantly associated with AA OS (B 0.047; p = 0.003) (Table 6).

Table 5: The relationship between the size of myopia OD and amplitude accommodation OD, age, gender, and parents with myopia

Parameter	B	SE	t	p	95% CI	
					Bottom	Above
AA OD	0.048	0.017	2.854	0.005	0.015	0.082
Age	0.146	0.064	2.278	0.025	0.019	0.274
Gender	-0.278	0.205	-1.356	0.178	-0.685	0.129
Myopia parent	-0.175	0.219	-0.797	0.427	-0.610	0.260

AA: Amplitude accommodation, SE: Standard error, CI: Confidence interval.

Discussion

This study examines school myopia, where the ages studied are from 7-to 13 years. The results obtained that age has a p < 0.001, so the age distribution is not normal. The sample has a median age of 9 years with a minimum age of 7 years and a maximum age of 12 years.

Table 6: Relationship between the size of myopia OS with amplitude accommodation OS, age, gender, and parents with myopia

Parameter	B	SE	t	p	95% CI	
					Bottom	Above
AA OS	0.047	0.015	3.096	0.003	0.017	0.077
Age	0.113	0.065	1.750	0.083	-0.015	0.242
Gender	-0.116	0.197	-0.839	0.403	-0.557	0.226
Myopia parent	-0.110	0.209	-0.524	0.601	-0.525	0.306

AA: Amplitude accommodation, SE: Standard error, CI: Confidence interval.

The highest age is 7 years, namely 28 students (24.8%), while the least is 12 years with 2 students (1.6%). Hashemi et al. study, 2017 from 5444 elementary school students aged 6-12 years, the highest age was 9 years with 1,035 students and the smallest were 6 and 12 years, namely 214 students and 619 students. Suryaningrum's study, 2014 found that the highest age of myopia in elementary school children was 11 years, namely 53 students (43.80%) while the smallest was 8 years with 10 students (8.26%).

Near activity has p < 0.001 with the median value of the Near activity being 78 Dh/week where the smallest student Near activity value is 40 Dh/week

and the largest student Nearest activity value is 214 Dh/week. Mutti *et al.* 2002 study on near activity and refractive errors obtained the value of the near activity that causes myopia is a mean of 65.1 ± 34.1 Dh which means that most of the near activity is at 31 Dh and 99.2 Dh is already at risk of causing myopia with a value of $p < 0.005$ which means significant.

125 Samples obtained from the study were 12 people who had myopia where 10 people used glasses while 2 people used contact lenses. Parents of students who have myopia as many as 34 students (27.2%). According to the study by Mutti *et al.*, 2002 of 67 myopic students, 29 students had 1 myopic parent. This study is inversely proportional to Suryaningrum, 2014 where out of 121 students, most of the students had been diagnosed with myopia, namely 84 students (69.4%).

This study shows that there is a relationship between NPC, both NPC Break and Recovery, and monocular and binocular AA on myopia. The relationship between NPC Break and the size of myopia obtained $p < 0.001$ and the correlation coefficient or $r = -0.332$, which means there is a relationship between NPC Break and the size of myopia where the larger the size of myopia, the smaller the NPC Break. The relationship between NPC Recovery and the size of myopia obtained p -value < 0.001 and the correlation coefficient or $r = -0.335$, which means that there is a relationship between NPC Recovery and the size of myopia where the larger the size of myopia, the smaller the NPC Recovery. The relationship between Binocular AA and the size of myopia obtained $p = 0.001$ and the correlation coefficient or $r = 0.287$, which means there is a relationship between Binocular AA and myopia size where the greater the size of myopia, the greater the Binocular AA. The relationship between AA OD and the size of myopia OD obtained $p = 0.017$ and the correlation coefficient or $r = 0.226$, which means that there is a relationship between AA OD and the size of myopia OD where the greater the size of myopia OD, the greater the AA OD. The relationship between AA OS and the size of myopia OS obtained $p = 0.007$ and the correlation coefficient or $r = 0.261$, which means that there is a relationship between AA OS and the size of myopia OS where the larger the size of myopia OS, the greater the AA OS. The results show that the smaller the NPC, the larger the myopia size, so the NPC has an inverse relationship with the myopia size, while the larger the AA, the larger the myopia size. NPC and AA with myopia measure have a significant relationship where $p < 0.05$.

Other studies comparing NPC and AA with measures of myopia in elementary school children have not been found by researchers. The data that researchers have found so far is how the relationship between AA and refractive error, as in the study of Abraham *et al.*, 2015 [10] where they studied AA with refractive errors and found the higher accommodation amplitude in the myopic population aged 35 and 44 years with the result

that the average value of AA in 3.71 times greater in the myopia group than hypermetropia and emmetropia in the 35–39-year-old group with $p < 0.005$ while the mean value of AA 2.63 greater in myopia compared to hypermetropia ($p < 0.0001$) and emmetropia ($p < 0.0001$) in the age group 40–44 years. A study by the Acta Ophthalmologica Institute in 1991, which looked for the relationship between Accommodation, Convergence, and Phoria with myopia progression, found that myopia progression in the NPA < 8 cm group was greater than that in the NPA > 8 cm group but not statistically significant $p > 0.05$. Myopia progression was slightly higher in children whose NPC was Near the nose with a significant p -value of $p = 0.0395$. In the study by Hashemi *et al.*, 2017 which in their study examined the relationship of AA with refractive errors and NPC in children aged 6–12 years, it was found that the higher AA was associated with the progression of spherical equivalent myopia with $p < 0.001$ with a correlation value of $r = 0.47$ which means have moderate relationship strength. The NPC value is related to AA where $p < 0.001$ with a correlation coefficient of $r = 0.47$, which means that the larger the AA, the smaller the NPC with a moderate strength of the relationship.

The results showed that age also affects the size of myopia in NPC Recovery where $p = 0.028$, AA binoculars where p -value = 0.036, and age affects the size of myopia OD on AA OD measurement $p = 0.025$. The study by Sun *et al.*, 2018 regarding the prevalence and risk factors of myopia at school age in Qingdao stated that age was associated with myopia where increasing age had a 1.43 times greater risk of myopia with $p < 0.001$. Mutti *et al.*, 2007 stated that the age of 9–16 years is the fastest-growing period for the occurrence of myopia. Age affects myopia because at school age, there is still growth in the length of the eyeball (axial length) and the presence of Near activity.

Limitation

This study is field research where what was planned at the beginning regarding the selection of samples may not be appropriate when the study is carried out due to various factors that exist in the field, besides that the time when the study takes place must be sufficient, some students have gone home before the study is finished due to the time to go home arrived and many parents refused to fill out the questionnaire due to the parent's fear of the examination being carried out on their children. Field research is the study that allows unexpected things to happen when a study is carried out, so before going to the field, careful planning needs to be carried out and thinking about all possibilities that can interfere with the study.

Myopia measurements were carried out without using cyclopentolate to neutralize accommodation when measuring myopia although there was no significant relationship between myopia measurements with or

without cyclopentolate. Field studies that measure myopia using a Snellen chart and make corrections with a trial lens require a long time to minimize the possibility of getting samples. Another study carried out myopia measurements by dripping cyclopentolate and using autorefractometer so that it would be faster to get myopia values even though the Snellen chart and Trial lens would get myopia measurements according to the standard.

The sample is taken only from elementary school children, while school myopia can occur during school age, so a sample of Junior high school children may then be taken. Age is associated with the occurrence of myopia, so the results of this study may still be influenced by age. Age is associated with the occurrence of myopia, so the results of this study may still be influenced by age. Future studies should make measurements by matching age so that there is no confusion in the results.

Conclusion

There is a correlation between NPC and AA with school myopia progression at near activity in Badung Regency. Smaller NPC was correlated with progression of myopia and higher AA was correlated with progression of myopia, although age was correlated with myopia progression.

Acknowledgment

This study was supported by Udayana University ophthalmologists, principals, teachers, parents, and students at Sibang Gede 1st elementary school, Kuta 1st elementary school, Jimbaran 4th elementary school, and Kerobokan Kelod 2nd elementary school.

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