The Effect of the Drill Method on the Forearm Passing Ability of Volleyball Athletes, Senior High School Students, and Junior High School Students: A Meta-Analysis Study

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Abstract. Study about the effect of the drill method on the *forearm passing* ability of volleyball has many conducted in field sport. Various studies explain that the drill method affects the forearm passing ability *of* volleyball, but results from every study tend to vary. The difference causes needed to do data analysis inclusive for giving the information thorough about the effect of the drill method on the forearm *passing* ability of volleyball. This study aims to know the effect of the *drill* method on the forearm passing ability of volleyball through the meta-analysis method with *JASP software*. This method collected data from results indexed research in *Google Scholar* with a search published in 2000–2022. Search results study conducted by entering the keywords "the effect" and "the *drill method*" and "*forearm passing*" and "volleyball". Results obtained found 267 articles with only 10 articles that meet the criteria. Data on the corresponding article criteria inclusion and exclusion study was taken to determine score *effect size* (ES) and *standard error* (SE). Based on the results analysis of 10 articles, the drill method has a different effect on the forearm passing ability of volleyball in the three subjects (athletes, senior high school students, and junior high school students).

Keywords: The Effect · The Drill Method · Forearm Passing · Volleyball

1 Introduction

A volleyball game is a game team where a player attempts to score by dropping the ball in the opponent's area [1]. Throughout its development, volleyball has been one branch of the big-ball sport that always competed in every competitive national and international sports event. A volleyball game must have the technique mastered, there are four namely: *service, passing, smash,* and *block* [2]. Mastery of the base technique could determine the perfect or not volleyball game because the basic technique of volleyball is a vital element in the game.

The basic technique of volleyball is important for improving players' abilities and skills. In volleyball games, the most preferred technique is to *smash,* so other techniques are very lacking [1]. The most important basic technique that must master is *forearm*

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passing because *forearm passing* can build attacks and accept attacks from opponents [3]. Players who dominate forearm passes will easily arrange attacks for points and withhold attacks from opponents to avoid getting points [4]. So, from that case we need to increase the ability of *forearm passing*, one of them using the *drill* method.

The drilling method is significant for increasing the ability of forearm pass, starting from skills until mastery. The drilling method is the ideal method for an athlete by aware of reaching maximum ability with gift burden physically, technically, tactically, and mentally regular, directed, increasing, gradual, and timed repeatedly [5]. The drilling method has goals: (a) ability to understand and control motor/motion aware, (b) grow and develop the level of intellectual, and (c) ability to analyze and connect linkages to something state [4]. The drill method is handy and recommended for practice ability *forearm passing*, to do repetition by keeping going continuously could move becomes right, more repeat movement so more quickly master to *forearm passing* technique [5].

This study aims to know the effect of the drill method on the *forearm passing ability of* volleyball on the subject of junior high school students, senior high school students, and athletes by separate use a meta-analysis method, with search published research in 2000–2022. Studies about the effect of the drill method *on the* ability *forearm passing of* volleyball have many done, but each study gives different results. Based on that explanation, need to conduct a study about the effect of the drill method on the ability *forearm passing of* volleyball with data analysis inclusive for giving comprehensive results of each subject (junior high school, senior high school, and athlete). A separate analysis was conducted to know by specific difference effect drill method to the ability *forearm passing* volleyball on a different subject.

2 Method

This study is a quantitative study with a meta-analysis design. A Meta-analysis is an analysis of an amount of study with systematic use of technique statistics to measure and classify results from relevant research to make exciting conclusions accurate [6].

The data in the study was obtained from scientific source literature in the form of article research published in the journal national. Data acquisition is made online via *google scholar.* Search process article conducted with visited the website of source that is https://scholar.google.com. Search by entering the keywords "the effect" and "the *drill method*" and "forearm *passing*" and "Volleyball" found 267 articles. Searching the sample uses *purposive random sampling*, a sampling technique using specific criteria. The criteria for selecting the sample are using inclusion and exclusion criteria as follows:

Criteria inclusion:

1. Articles with titles "*drill*", "forearm *passing*", and "volleyball".
2. Articles published in journals scientific national
3. Articles published from 2000 to 2022.
4. Article sourced from *google scholar.*
5. The study was done in Indonesia.
6. The article focuses on junior high school students, senior high school students, and athletes.

7. The taken article is a whole article that can be accessed.
8. The taken article uses the structure of the quantitative study, in particular experiment

Criteria exclusion:

2.1 Study with Different Definition Operations

Based on criteria inclusion and exclusion, as many as 10 samples were obtained that meet the analyzed requirements. Following this served step selection of data to be analyzed: (Fig. 1).

Search results with google scholar identified as many as 267 articles with entering keywords "drill method", "forearm passing", and "volleyball". Based on the election, the article related to influence or experiment obtained 142 studies for review. Of 142 articles, got 115 articles matched with question research related to volleyball, forearm passing, and drill method. That article reviewed the abstract and obtained 17 corresponding articles. The 98 articles are not matched with criteria inclusion and exclusion, related full-text article, accessed or not, published in the journal national, published on vulnerable 2000 to 2022, and research on the articles done in Indonesia. A total of 17 articles were obtained, and 7 articles were not by the criteria based on the subject (junior high school students, senior high school students, and athletes). At the end step selection, only 10 articles were obtained per criteria for analysis, consisting of 4 articles for junior high school subjects, 3 for senior high school subjects, and 3 for athlete subjects. Each study on a different subject is then analyzed separately.

The next stage is data analysis with (1) Identification variable study with group data into the table in accordance column the variable, (2) Identifying the value of r on each analyzed article. If the result analyzed research only load value of F or t, then transformed to in value of r, using the equation:

1. $F = t^2$
2. $t = \sqrt{F}$
3. $r = \frac{t}{\sqrt{t^2+N-2}}$

(3) transform r to the z distribution, which is the *effect size* from every study, then count variance, (4) calculate the *standard error* of z, and (5) calculate the *summary effect* from whole studies [7]. Calculation *summary effect* conducted using meta-analysis with help application *Jeffrey's Amazing Statistics Program (JASP)* software version 0.16.2.0.

3 Result and Discussion

3.1 Result

The next step is a meta-analysis study using data selected per criteria inclusion and exclusion. A total of 257 data does not fulfill the criteria of 267 data obtained, so only get 10 data are ready for analysis. This data was obtained from a *Google Scholar* database source. Analyzed studies served in table following: (Table 1).

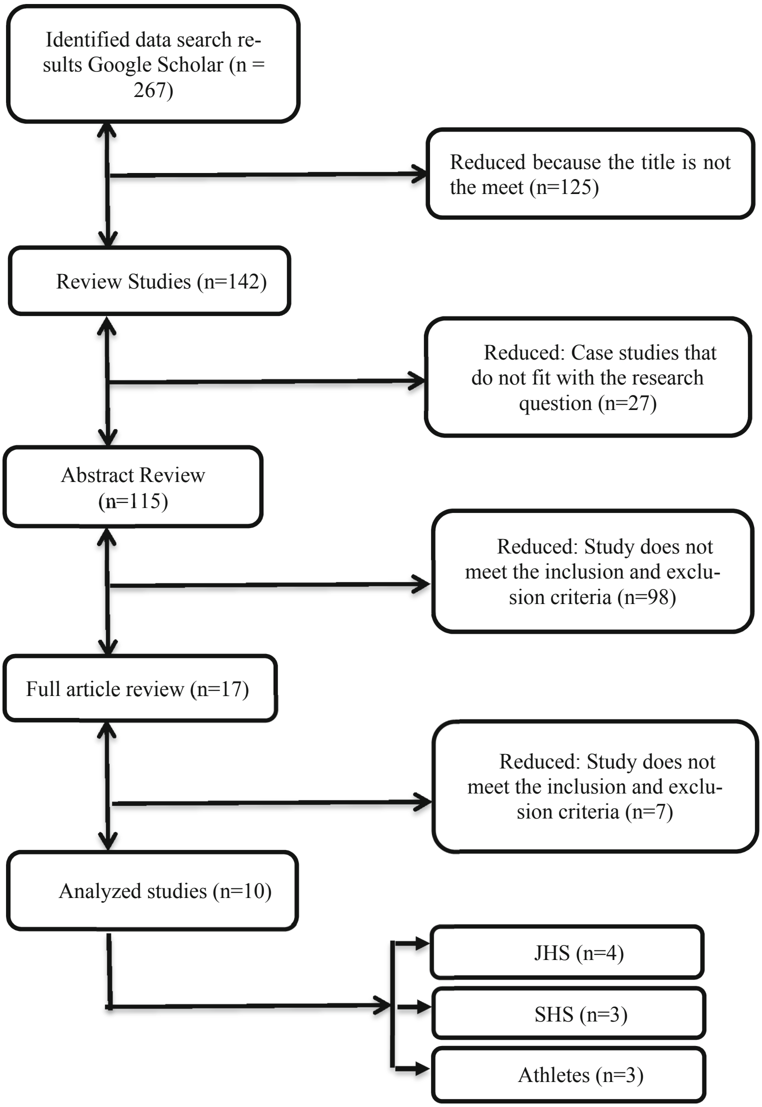

Fig. 1. The flowchart in identifying case study data that are eligible for meta-analysis.

3.1.1 Test for Heterogeneity in Studies with Junior High School Subject

Fixed and Radom Effects This analysis determined which model is suitable for evaluating *effect sizes. The fixed effect* is suitable for use in a moment when *effect size* among analyzed studies has no significant difference, while the *Random effect* model is suitable for use in a moment when *effect size* among analyzed studies has a significant difference (heterogeneity) (Table 2).

Table 1. Data study to be conducted meta-analysis studies.

No.	Author Name, Year	Characteristics Sample	N	t- count	*R*	ES	SE
1	Yahya & Sufitriono, 2020 [8]	Junior High School	30	16.208	0.95062	1.83819	0.19245
2	Hadi, 2022 [9]	Junior High School	12	18.52	0.98573	2.46792	0.33333
3	Jayanti & Nasuka, 2021	Junior High School	15	4.47	0.77835	1.04118	0.28868
4	Subagio et al., 2022 [10]	Junior High School	20	24.16	0.984929	2.44028	0.24253
5	Isman et al., 2020 [11]	SMK	32	15.789	0.94476	1.78067	0.18569
6	Aziz Maulana et al., 2020 [12]	Senior High School	27	5.93	0.76450	1.00698	0.20412
7	Nur Syafe & Noviardila, 2021	Senior High School	15	1.4734	0.37829	0.39806	0.28867
8	Adi & Indarto, 2021 [13]	Athlete	20	−12,645	−0.94806	−1.81225	0.24254
9	Erwin et al., 2019	Athlete	16	19	0.980196	2.302521	0.27735
10	Mulya & Rifki, 2019	Athlete	14	5.22	0.833219	1.198676	0.30151

Table 2. Analysis of *fixed dan random effects* studies with the subject junior high school students.

	Q	df	p
Omnibus test of Model Coefficients	35.580	1	< .001
Test of Residual Heterogeneity	16.736	3	< .001

Note. p -values are approximate.
Note. The model was estimated using Restricted ML method.

Interpretation: From the calculation of the results above, 4 *effect sizes* of analyzed studies show results heterogeneous (Q = 16,736; p < 0.001). *p*-value is less than a significant score of 0.05, so the *Random effect* model is more suitable for determining the average *effect size* of the 4 analyzed studies. Analysis result also shows the possibility of investigating moderator variables that affect connection between drill method and *forearm passing*.

Table 3. Analysis of coefficients studies with the subject junior high school students.

						95% Confidence Interval
	Estimate	Standard Error	z	p	Lower	Upper
intercept	1.943	0.326	5.965	< .001	1.305	2.582

Note. Wald test.

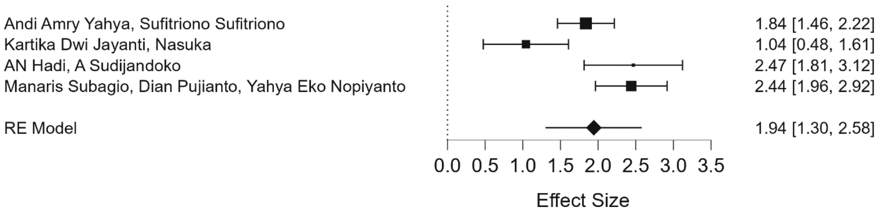

Fig. 2. Analysis of *forest plot* studies with the subject junior high school students.

Coefficients Analysis *coefficients were* conducted to determine how correlation and significance between variables. C*oefficients* test conducted with meaning measure profound modeling ability to explain how much variable independent by together influence variable dependent whom the value can indicate (Table 3).

Interpretation: The analysis result showed a significant positive correlation between the drill method and forearm passing (z = *5.965*; p < 0.001; 95%CI [1.305; 2.582]. Correlation positive showed with score positive *estimate of* 1.943, while significant or not the drill method to forearm pass showed with a score *p-value* less than score significant of 0.05. The effect of the drill method to ability the forearm passing including in high category. High, medium, or low categories this seen from results *estimated in* table (1.943). This category refers to Cohen (1992), where the value of r = 0.1 include the low category, r = 0.3 include the medium category, and r = 0.5 include the high category.

Forest Plot The forest plots load various elements. *Forest Plot* was used to show *effect size* data from each study, average *effect size*, top limit, and forearm limit from analyzed studies that showed in form stem. Each stem in the *forest plot* has meant certain. The left end is the forearm limit and the right end is the top limit. The section middle load rectangle shows a different size and weighting *effect size* from each study. At the bottom, the diamond shape shows the average *effect size* from every analyzed study (Fig. 2).

Interpretation: The *forest plot* presents the distribution of *effect sizes data.* Based on the *forest plot* above, *effect size* studies analyzed a great variety between 1.04 and 2.47. Colored square image black in the *forest plot* shows a significant score from each study. The bigger rectangle, so bigger the score *effect size of* the analyzed study, as well as otherwise. *Random* effects inside the *forest plot* be marked with different shaped, 1.94 (Prasiska, 2017).

Funnel Plot Funnel plot is a scatter effect treatment for size precision study. *Funnel plot* is used to detect bias. Publication bias is research that reports a relative effect bigger

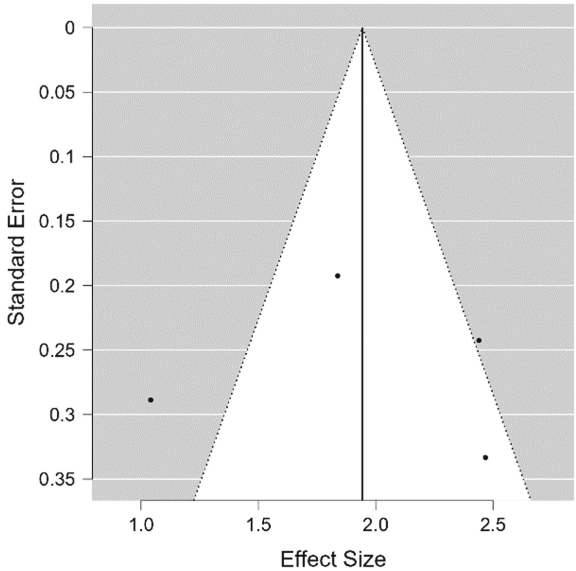

Fig. 3. The *funnel plots* studies with the subject junior high school students.

Table 4. Analysis of *egger's test* studies with the subject junior high school students.

	z	P
sei	0.113	0.910

for a question certain to be published than research that reports a relative effect smaller for the same question, so that information obtained is irrelevant, limited, and inaccurate (Fig. 3).

Interpretation: Dot image colored black on *funnel plot* is analyzed studies. Scatter points will shape symmetrical results or asymmetrical. Difficult to know that, so that requires *Egger's test* for the test to be a symmetric *funnel plot* or an asymmetric one.

EGger's Test *Egger's test* evaluates potential publication bias in meta-analysis through a result *funnel plot*. It could be interpreted that we do not have enough power to detect a bias. However, using *egger's test,* we have enough power to detect bias by showing if the *p-value* is bigger or smaller than the significant level. If the *p-value* is bigger than the level significant, there is no publication bias (symmetrical); if the *p-value* is smaller than the level significant, there is a publication bias (asymmetric) (Table 4)

Interpretation: Analyzed studies confirm that the *funnel plot* on the picture shaped symmetrical, shown with a *p-value* > 0.05, which is 0.910 in the result of *egger's test.* The bigger *p-value* than the level significant show that the *picture's funnel plot is symmetrical, meaning* there is no publication bias.

Table 5. Analysis of file drawer analysis studies with the subject junior high school students.

	File-safe N	Target Significance	Observed Significance
Rosenthal	343,000	0.050	$< .001$

Table 6. Analysis of *fixed and random effects* studies with the subject senior high school students.

	Q	df	p
Omnibus test of Model Coefficients	7.466	1	0.006
Test of Residual Heterogeneity	18.287	2	$< .001$

Note. p-values are approximate.
Note. The model was estimated using Restricted ML method.

File Drawer Analysis *File drawer analysis* is used for knowing bias in a meta-analysis by estimating the amount of research that has not been published. Studies with significant results from statistics tend to be published, and research with results that are not significant by statistics tends not to be published, resulting in the analyzed data being not thorough because conclusions are drawn only on published. This is what causes *file drawer analysis* can detect there is the absence of research bias (Table 5).

Interpretation: The result *fail-safe N* found 343 studies identified not yet published. *File-safe N can* also be used for knowing publication bias by using *Rosenthal's* formula (5k + 10). K is amount analyzed studies, i.e. 4 studies, so 5K + 10 = 5(4) + 10 = 30, with *the target significance is* 0.05 and $p < 0.001$. *Fail-safe N* value (343) earned bigger than 5K + 10, so there is no publication bias.

3.1.2 Test for Heterogeneity in Studies with Senior High School Subject

Fixed and Random effects This analysis determined which model is suitable for evaluating *effect sizes. The fixed effect* is suitable for use in a moment when *effect size* among analyzed studies has no significant difference, while the *Random effect* model is suitable for use in a moment when *effect size* among analyzed studies has a significant difference (heterogeneity) (Table 6).

Interpretation: From the calculation of the results above, 3 *effect* sizes of analyzed studies show results heterogeneous ($Q = 18{,}287$; $p < 0.001$). *p-value* is less than a significant score of 0.05, so the *Random effect* model is more suitable for determining the average *effect size* of the 3 analyzed studies. Analysis result also shows the possibility of investigating moderator variables that affect connection between drill method and *forearm passing*.

Coefficients

Analysis *coefficients were* conducted to determine how correlation and significance between variables. *Coefficients* test conducted with meaning measure profound modeling ability to explain how much variable independent by together influence variable dependent whom the value can indicate (Table 7).

Table 7. Analysis of *coefficients* studies with the subject senor high school students.

					95% Confidence Interval	
	Estimate	Standard Error	Z	p	Lower	Upper
Intercept	1.084	0.397	2.732	0.006	0,307	1.862

Note. Wald test.

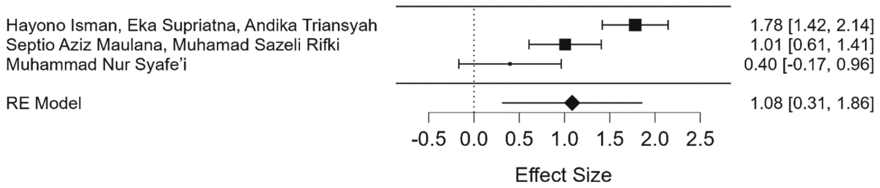

Fig. 4. Analysis of forest plot studies with the subject senior high school students.

Interpretation: The analysis result showed a significant positive correlation between the drill method and forearm passing (z = *2.732*; p 0.006; 95%CI [0.307; 1.862]. *Correlation* positive showed with score positive *estimate of* 1.084, while significant or not the drill method to forearm pass showed with a score *p-value* less than score significant of 0.05. The effect of the drill method to ability the forearm passing including in high category. High, medium, or low categories this seen from results *estimated in* table (1.084). This category refers to Cohen (1992), where the value of r = 0.1 include the low category, r = 0.3 include the medium category, and r = 0.5 include the high category.

Forest Plot Forest plots load various elements. *Forest Plot* was used to show *effect size* data from each study, average *effect size*, top limit, and forearm limit from analyzed studies that showed in form stem. Each stem in the *forest plot* has meant certain. The left end is the forearm limit and the right end is the top limit. The section middle load rectangle shows a different size and weighting *effect size* from each study. At the bottom, the diamond shape shows the average *effect size* from every analyzed study (Fig. 4).

Interpretation: The *forest plot* presents the distribution of *effect sizes data.* Based on the *forest plot* above, *effect size* studies analyzed a great variety between 0.40 and 1.78. Colored square image black in the *forest plot* shows a significant score from each study. The bigger rectangle, so bigger the score *effect size of* the analyzed study, as well as otherwise. *Random effects* inside the *forest plot* be marked with different shaped, 1.08 (Prasiska, 2017).

Forest Plot Forest plots load various elements. *Forest Plot* was used to show *effect size* data from each study, average *effect size*, top limit, and forearm limit from analyzed studies that showed in form stem. Each stem in the *forest plot* has meant certain. The left end is the forearm limit and the right end is the top limit. The section middle load rectangle shows a different size and weighting *effect size* from each study. At the bottom, the diamond shape shows the average *effect size* from every analyzed study (Fig. 5).

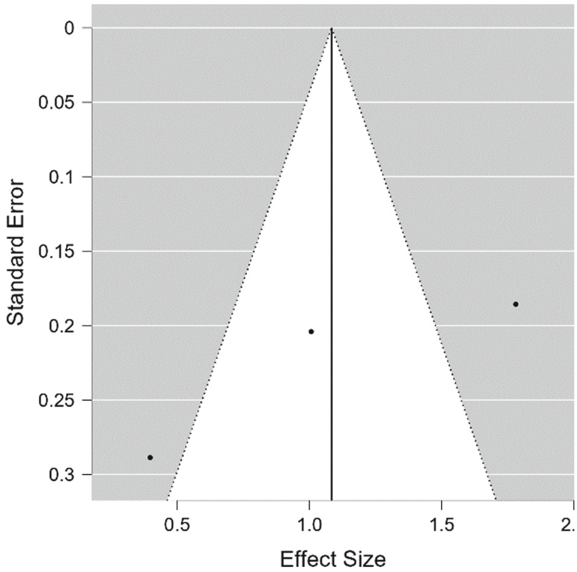

Fig. 5. Analysis *funnel plot* studies with the subject senior high school students.

Table 8. Analysis of *egger's test* studies with the subject senior high school students.

	Z	p
sei	−2.094	0.036

Interpretation: Dot image colored black on *funnel plot* is analyzed studies. Scatter points will shape symmetrical results or asymmetrical. Difficult to know that, so that requires *Egger's test* for the test to be a symmetric *funnel plot* or an asymmetric one.

EGGER'S Test *Egger's test* evaluates potential publication bias in meta-analysis through a result *funnel plot*. It could be interpreted that we do not have enough power to detect a bias. However, using *egger's test,* we have enough power to detect bias by showing if the *p-value* is bigger or smaller than the significant level. If the *p-value* is bigger than the level significant, there is no publication bias (symmetrical); if the *p-value* is smaller than the level significant, there is a publication bias (asymmetric) (Table 8).

Interpretation: Analyzed studies confirm that the *funnel plot* on the picture shaped asymmetrical, shown with a *p-value* < 0.05, which is 0.036 in the result of *egger's test.* The smaller *p-value* than the level significant show that the *picture's funnel plot is asymmetrical, meaning* there is publication bias.

File Drawer Analysis *File drawer analysis* is used for knowing bias in a meta-analysis by estimating the amount of research that has not been published. Studies with significant results from statistics tend to be published, and research with results that are not significant by statistics tends not to be published, resulting in the analyzed data being

Table 9. Analysis of *file drawer analysis* studies with the subject senior high school students.

	Fail-safe N	Target Significance	Observed Significance
Rosenthal	91.000	0.050	< .001

Table 10. Analysis of *fixed and random effects* studies with the subject athlete.

	Q	df	p
Omnibus test of Model Coefficients	0.206	1	0.650
Test of Residual Heterogeneity	136.860	2	< .001

Note. p -values are approximate.
Note. The model was estimated using Restricted ML method.

not thorough because conclusions are drawn only on published. This is what causes *file drawer analysis* can detect there is the absence of research bias (Table 9).

Interpretation: The result *fail-safe N* found 91 studies identified not yet published. *File-safe N can* also be used for knowing publication bias by using *Rosenthal's* formula (5k + 10). K is amount analyzed studies, i.e. 3 studies, so 5K + 10 = 5(3) + 10 = 25, with *the target significance is* 0.05 and p < 0.001. *Fail-safe N* value (91) earned bigger than 5K + 10, so there is no publication bias.

3.1.3 Test for Heterogeneity in Studies with Athlete Subject

Fixed and Random Effects This analysis determined which model is suitable for evaluating *effect sizes. The fixed effect* is suitable for use in a moment when *effect size* among analyzed studies has no significant difference, while the *Random effect* model is suitable for use in a moment when *effect size* among analyzed studies has a significant difference (heterogeneity) (Table 10).

Interpretation: From the calculation of the results above, 3 *effect* sizes of analyzed studies show results heterogeneous (Q = 136.860; p < 0.001). *p-value* is less than a significant score of 0.05, so the *Random effect* model is more suitable for determining the average *effect size* of the 3 analyzed studies. Analysis result also shows the possibility of investigating moderator variables that affect connection between drill method and *forearm passing*.

Coefficients Analysis *coefficients were* conducted to determine how correlation and significance between variables. *Coefficients* test conducted with meaning measure profound modeling ability to explain how much variable independent by together influence variable dependent whom the value can indicate (Table 11).

Interpretation: The analysis result showed a positive correlation between the drill method and forearm passing (z = *0.454*; p 0.650; 95%CI [−1.856; 2.974]. Correlation positive showed with score positive *estimate of* 0.559, while significant or not the drill method to forearm pass showed with a score *p-value* bigger than score significant of 0.05.

Table 11. Analysis of coefficients studies with the subject athlete.

					95% Confidence Interval	
	Estimate	Standard Error	z	p	Lower	Upper
intercept	0.559	1.232	0.454	0.650	−1.856	2.974

Note. Wald test.

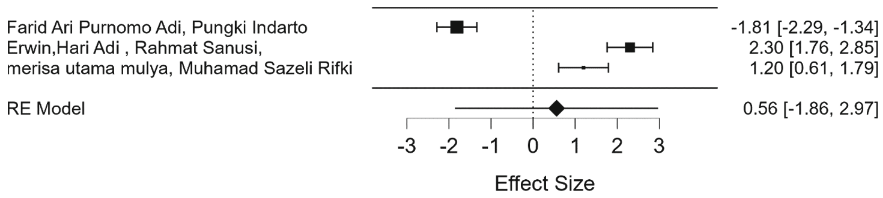

Fig. 6. Analysis of *forest plot* studies with the subject athlete.

The effect of the drill method to ability the forearm passing including in high category. High, medium, or low categories this seen from results *estimated in* table (0.559). This category refers to Cohen (1992), where the value of r = 0.1 include the low category, r = 0.3 include the medium category, and r = 0.5 include the high category.

Forest Plot *Forest plots* load various elements. *Forest Plot* was used to show *effect size* data from each study, average *effect size*, top limit, and forearm limit from analyzed studies that showed in form stem. Each stem in the *forest plot* has meant certain. The left end is the forearm limit and the right end is the top limit. The section middle load rectangle shows a different size and weighting *effect size* from each study. At the bottom, the diamond shape shows the average *effect size* from every analyzed study (Fig. 6).

Interpretation: The *forest plot* presents the distribution of *effect sizes data.* Based on the *forest plot* above, *effect size* studies analyzed a great variety between −1.81 and 2.30. Colored square image black in the *forest plot* shows a significant score from each study. The bigger rectangle, so bigger the score *effect size of* the analyzed study, as well as otherwise. *Random* effects inside the *forest plot* be marked with different shaped, 0.56 (Prasiska, 2017).

Funnel Plot *Funnel plot* is a scatter effect treatment for size precision study. *Funnel plot* is used to detect bias. Publication bias is research that reports a relative effect bigger for a question certain to be published than research that reports a relative effect smaller for the same question, so that information obtained is irrelevant, limited, and inaccurate (Fig. 7).

Interpretation: Dot image colored black on *funnel plot* is analyzed studies. Scatter points will shape symmetrical results or asymmetrical. Difficult to know that, so that requires *Egger's test* for the test to be a symmetric *funnel plot* or an asymmetric one.

EGGER's Test *Egger's test* evaluates potential publication bias in meta-analysis through a result *funnel plot*. It could be interpreted that we do not have enough power to detect

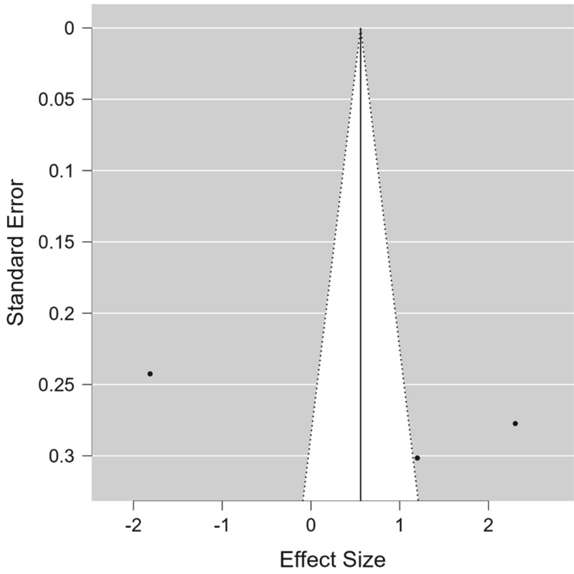

Fig. 7. Analysis of *funnel plot* studies with the subject athlete.

Table 12. Analysis of *egger's test* studies with the subject athlete.

	Z	P
sei	1.235	0.217

a bias. However, using *egger's test,* we have enough power to detect bias by showing if the *p-value* is bigger or smaller than the significant level. If the *p-value* is bigger than the level significant, there is no publication bias (symmetrical); if the *p-value* is smaller than the level significant, there is a publication bias (asymmetric) (Table 12).

Interpretation: Analyzed studies confirm that the *funnel plot* on the picture shaped symmetrical, shown with a *p-value* > 0.05, which is 0.217 in the result of *egger's test.* The bigger *p-value* than the level significant show that the *picture's funnel plot is symmetrical, meaning* there is no publication bias.

File Drawer Analysis *File drawer analysis* is used for knowing bias in a meta-analysis by estimating the amount of research that has not been published. Studies with significant results from statistics tend to be published, and research with results that are not significant by statistics tends not to be published, resulting in the analyzed data being not thorough because conclusions are drawn only on published. This is what causes *file drawer analysis* can detect there is the absence of research bias (Table 13).

Interpretation: The result *fail-safe N* found 6 studies identified not yet published. *File-safe N can* also be used for knowing publication bias by using *Rosenthal's* formula (5k + 10). K is amount analyzed studies, i.e. 3 studies, so $5K + 10 = 5(3) + 10 = 25$,

Table 13. Analysis of *file drawer analysis* studies with the subject athlete.

	File-safe N	Target Significance	Observed Significance
Rosenthal	6.000	0.050	0.003

with *the target significance is* 0.05 and $p < 0.001$. *Fail-safe N* value (6) earned smaller than 5K + 10, so there is publication bias.

3.2 Discussion

Forearm passing becomes the most helpful technique in volleyball because the forearm pass is not only for giving bait to friends but also for building an attack to attack the opponent [12]. Forearm p*assing* is also a base technique to receive the enemy's spike that escapes from the *block* [5]. From that need to increase ability forearm *passing,* one of them used the drill method. *The d*rilling method is the repetitive practice of movement order skills in the dominant technique to increase [14].

This study was analyzed using a meta-analysis method, where this method could reduce error taking samples and determine the accuracy of analyzed results to conclude *effect size* from every study [15]. Meta-analysis is a method that focuses on differences and combines results from several different studies [16]. Based on the search, there are still few studies about the effect of the drill method on forearm passing in athletes, junior high school students, and senior high school students. It is also a challenge to research this and share the researcher next. The analysis showed that each subject has different relationships between the drill method and the forearm pass. The difference seen from heterogeneity test results third different subjects. Mixed results in some studies cause needed analysis more about the effect of the drill method to forearm passing of volleyball to avoid publication bias. Influencing factors result in each study between them appropriate whether or not in taking the sample, measured variables, data analysis, and external factors [17].

The results show that the third subject is more suitable for analysis using the *random effects model* because the third *p-value* is less than the level significant of 0.05. *Random effect* models could show the analyzed data character as heterogeneous, and it could be concluded that every analyzed study has different results. Junior and senior high school subjects show a significant positive correlation between the drill method and *forearm passing,* as seen from their positive score *estimate* and *p-value* of less than 0.05. Significant positive correlation occurs when one variable is enhanced, so the other variables will also increase with the real difference. That means if the drill method is conducted continuously, it will give impact by straight to forearm pass ability. Whereas athlete subjects have a positive correlation but no significance, it showed from a positive score *estimate* and *p-value* bigger than 0.05. Correlation positive that is not significant showing that the drill method effect on improvement forearm pass ability but no give impact by straight away. The *random effect* (r_{RE}) value for junior high school subjects was 1.94, for senior high school subjects was 1.08, and for athlete subjects was 0.56. This value shows that two variables are connected with the height category, where the *drill method* carried out greatly affects the increase in the forearm pass ability.

To see whether publication bias can be determined through the results *funnel plot* and *fail-safe N,* but very difficult to identify is a symmetrical distribution or an asymmetrical distribution on the *funnel plot*, so use *egger's test.* Based on the results*, the p-value for junior high school* subjects was 0.910, senior high school subjects was 0.036, and athlete subjects was 0.217. The *p-value* > 0.05 shows a symmetrical *funnel plot, meaning* there is no publication bias. Becoming a junior high school subject and athlete shows no publication bias, while senior high school subjects have publication bias. The final analysis is *fail-safe N,* where a score of *fail-safe N* can show the number of suspected articles that have not been published [16]. The score of *fail-safe N* for junior high school subjects was 343, senior high school subjects was 91, and athletes was 6. Based on results from junior high school and senior high school subjects, there is no publication bias, while for athletes, there is publication bias. There is a publication bias in the results of *egger's test* and *fail-safe N* from senior high school subjects and athletes suspected because too few analyzed studies and their studies have not been published in a national journal. Amount too few studies because not yet published nor because other factors allow increasing bias, this because information obtained becomes less and cause remaining data not filtered with good. These subjects study only junior high school, senior high school, and athletes. The third subject is the category of a beginner athlete, not a professional athlete. The subject was chosen because studies with other subjects such as elementary school and college students are minimal.

The results show that the meta-analysis of the study about the effect of the drill method *on* forearm *pass* ability could be received as actual data and appropriate with the condition at this moment. It means the obtained information shows something true: the drill method affects the forearm passing ability of volleyball. The advantage of this study is using 3 subjects: junior high school students, senior high school students, and athletes, then analyzed by separating for knowing difference influences on each subject. The weakness in this research is that the database used is only sourced from *google* scholar and articles published in national journals, so the data is limited. Subjects analyzed only junior high school, senior high school, and athletes, which affected the number of analyzed articles. This limited selected subject caused required to study more for another subject to add several analyzed articles and know the effect of the drill method to forearm passing of volleyball for a different subject. Besides that, multiplying source search articles and adding range year published articles can also conduct the next researcher to complete existing challenges.

4 Conclusion

The analysis results of the articles obtained with the keywords "the effect" and "the *drill method*" and "forearm *passing*" and "volleyball", shows that the drill method has a different effect on the forearm passing of volleyball in the three subjects (athletes, junior high school students, and senior high school students). Junior and senior high school subjects have a high influence and significance on the drill method against the forearm passing ability *of* volleyball. In contrast, subject athletes have a high influence but no significance. It showed through results analysis *random effects. S*enior high school subjects found publication bias indicated through the *egger's test results,* along with subject athlete indicated by analysis *file-safe N results*. There is no publication bias for junior high school subjects on *Egger's test* and analysis *file-safe N*.

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