



# International Journal of Physical Education, Sports and Health

P-ISSN: 2394-1685  
E-ISSN: 2394-1693  
Impact Factor (RJIF): 5.38  
IJPESH 2023; 10(1): 160-165  
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[www.kheljournal.com](http://www.kheljournal.com)  
Received: 01-10-2022  
Accepted: 05-11-2022

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## Smash, block, and service technical contribution in volleyball games at the diy regional student sports week (Popda) championship in 2022

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**DOI:** <https://doi.org/10.22271/kheljournal.2023.v10.i1c.2766>

### Abstract

This study aims to find out how much the contribution of smash, block and service techniques in volleyball games at the POPDA DIY championship in 2022.

This type of research uses a quantitative descriptive survey method. The data collection technique uses direct observation by researchers. The validity and reliability of the instrument used Aiken's V analysis and between raters. A total of 20 matches consisting of 5 men's teams and 5 women's teams were then analyzed to find out how much the smash, block and serve techniques contributed.

The results showed that (1) The overall basic technical contribution for the men's team, namely smash was 64.49%, block was 24.62% and service was 22.83%, while for the women's team smash was 58.04%, block by 21.05% and service by 23.07%. (2) The contribution of the smash, block and service techniques of each team, namely in the City men's team, the smash technique was 59.30%, the block was 23.93%, and the service was 21.60%. The Sleman team smash technique is 71.96%, block is 23.59%, and service is 32.01%. The Bantul team smash technique is 65.02%, block is 22.5%, and service is 28.53%. The Gunung Kidul Team smash technique is 63.88%, block is 18.63%, and service is 11.78%. The Kulon Progo Team smash technique is 65.94%, block is 23.63%, and service is 16.08%. Contributions for the women's team, namely the City team with smash techniques, amounted to 63.44%, blocks amounted to 15.49%, and service contributed 27.06%. The Sleman team smash technique is 77.01%, block is 33.33%, and service is 27.66%. The Bantul team smash technique is 58.25%, block is 27.71%, and service is 22.25%. The Gunung Kidul Team smash technique is 46.37%, block is 16.46%, and service is 13.97%. The Kulon Progo team smashed 31.32%, blocked 13.54%, and served 8.91%.

**Keywords:** Contribution of smash, block, service technique, volleyball game, Popda diy 2022

### Introduction

Sport is one of the human needs which is a basic element and is very influential in the formation of a strong soul (spiritual) and body (body or body). Every human being who often carries out sports activities wants to have better spiritual and physical health than humans who do not often or never do sports activities. Carrying out regular physical activity will be beneficial for managing body weight and strengthening the vascular system, which means that efforts to maintain health can be carried out through physical activity (Oktariana & Hardiyono, 2020) <sup>[12]</sup>.

Volleyball is a team sport that is played by 2 teams and each team occupies a plot of the playing field which is bounded by a net or net (Recopé, *et al.*, 2019) <sup>[15]</sup>; (Fortin-Guichard, *et al.*, 2020) <sup>[6]</sup>; (Kirby & Kluge, 2022) <sup>[9]</sup>. Volleyball game has four basic techniques, namely *service*, passing, smash, and block (Junior, 2018) <sup>[8]</sup>; (Alnedral, *et al.*, 2020) <sup>[1]</sup>; (Hiska, 2019) <sup>[7]</sup>; (Siva & Rajan, 2018) <sup>[16]</sup>; (Pekas, *et al.*, 2019) <sup>[13]</sup>. Mastery of basic volleyball techniques must be done well, in order to create a perfect volleyball game. Volleyball is a team sport played by six people in each team. The game of volleyball will run well if every player can master the basic techniques of playing volleyball correctly.

Ben Ayed, *et al.* (2020) <sup>[5]</sup> explained that "Volleyball is characterized by a great amount of jumps, skips, hops and other kinds of take-off". Volleyball is played by 2 teams facing each other on a field that is 18 meters long and 9 meters wide. In 1 team consists of at least 6 people. If there are fewer than 6 players on the field, the team in question will be deemed to have lost (Masanovic, *et al.*, 2019) <sup>[10]</sup>.

For each team and the two teams are separated by a net (Widianingsih, *et al.*, 2021) <sup>[21]</sup>; (Atabekov, 2020) <sup>[3]</sup>. Volleyball is a sport that can be played by children to adults, both women and men. By playing volleyball, the elements of thinking, abilities and feelings will be well developed. Besides that, personality can also develop properly, especially personal control, discipline, cooperation, and a sense of responsibility for what he does. Volleyball is a game played in the form of teamwork. Each team tries to pass the ball as quickly as possible to the opponent's area, using legal techniques and tactics and playing the ball.

In playing volleyball in carrying out the techniques it is required to be efficient and effective in order to get as many points as possible. To get good and efficient performance it is required to do exercises that take a long time and are influenced by components, namely physical, tactical, technical and mental. The components that affect the performance of volleyball athletes are physical, tactical, technical, and mental. Just like physical skills, preparation for the mental condition of players also has an important role in preparing to improve athlete performance. If the athlete's confidence increases, the athlete's performance will also increase (Vuorinen, 2017) <sup>[19]</sup>.

The basic techniques in volleyball must be well mastered. Beutelstahl (2015: 9) states that technique is a procedure that is developed based on practice and aims to find a solution to a particular movement problem in the most economical and useful way. In detail, the volleyball technique is divided into several parts. Aziz & Irawan (2021) <sup>[4]</sup>; Zhang & Zhong (2021) <sup>[22]</sup> explained that the basic techniques in volleyball games are: (1) underhand service techniques, (2) upper hand service techniques, (3) underhand passing techniques, (4) overhand passing techniques, (5) bait techniques (set up), (6) smash technique, (7) block technique (dam).

The principle of this game is quite simple, namely playing the ball before it hits the floor of the field. Volleying or bouncing the ball into the air can use all members or parts of the body from toe to head with perfect reflections. Based on these two opinions, it can be concluded that the game of volleyball is a game that is carried out by bouncing the ball using all parts of the body to be played on the playing field itself three times. Requirements for the ball's reflection must be perfect not contrary to applicable regulations. The goal of volleyball is to cross the ball to the opponent's playing area as difficult as possible to drop or kill the ball in order to win. Meanwhile, the aim is to win the game by turning off the ball in the opponent's square, and keeping the ball from falling on its own field. Thus it is clear that the game of volleyball is quite simple, namely defending and attacking.

In volleyball games, it is possible to obtain points (values) from the results of service, block, smash and opponent's mistakes. If the service performed does not result in a number, then there are still other techniques that can generate a number (value).

All the techniques contained in volleyball games can be used to carry out attacks both directly and indirectly so as to produce points. The service technique is the first stroke as a sign of the start of the volleyball game. At this time the service technique can be used as an attack blow against an opponent which is immediately deadly. This is because the ball is fully controlled by the server (service actor). In addition to this, the server (service actor) can hit the ball as hard as possible with his service technique without any obstacles getting in the way. While the Block technique is used to defend, especially front defense against opponent

attacks. Block has a very basic purpose, which is to block attacks from opponents or cover part of the field from the attacker. Based on the records of the 1972 Munich Olympics finalist team, the percentage of technical errors that occurred were service errors (5%), service reception (3%), passing and baiting (1%) and attacks (13%) (PP.PBVSI, 1995) <sup>[14]</sup>.

Smash, block and service techniques have the same percentage to turn off and produce numbers (values) so as to win. In addition to the element of mastery of these techniques there are many factors that influence success in playing volleyball. These factors include: physical condition, tactics, and mental maturity. These opinions do not have to be taken for granted, but need to be studied and researched further so that it is known exactly how much the contribution of these factors is. On this occasion the researcher wants to try to research with the title: "Contribution of Smash, Block and Service Techniques in Volleyball Games at the 2022 DIY POPDA Championships". In this study the researchers used a sample of male and female volleyball teams participating in POPDA DIY in 2022. To find out whether the contribution of smash, block and service techniques that occurred at POPDA DIY will show a good percentage or require more efficient training.

### Research Methodology

Arikunto (2013) <sup>[2]</sup> says that the research method is the method used by researchers in collecting research data. The research method can be interpreted as a scientific way to obtain valid data with the aim of finding, developing, and demonstrating certain knowledge so that in turn it can be used to understand, solve, and anticipate problems in the field of education. (Sugiyono, 2016) <sup>[17]</sup>. The method used is a survey with data collection techniques using observation (observation) by judges and document analysis (video).

The type of research used is a type of quantitative research. Quantitative research is usually used to test a theory, to present a fact or to describe statistics, to show relationships between variables, and some are to develop concepts. The technique of this research is direct observation.

In this study the population used was students who took part in POPDA volleyball for both men and women in DIY in 2022. The volleyball championship was organized by the Youth and Sports Education Office. In this championship, 5 men's volleyball teams and 5 women's volleyball teams were competed from 5 regencies in DIY, namely Kulon Progo Regency, Bantul Regency, Sleman Regency, Yogyakarta City, and Gunung Kidul Regency.

### Results and Discussion

In this study, the subjects studied were men's volleyball matches and women's volleyball matches which took place at the Regional Student Sports Week in DIY. The results and discussion of this study are as follows.

#### 1. Men's volleyball match

In volleyball there are techniques for attacking and defending techniques. The technique for attacking a team is starting with a service punch from the opponent played by the service receiving team, usually by using the under passing technique then fed by the set-upper and followed by a spike or smash as an attack. Each team that is playing may only touch the ball a maximum of three times and may not be touched by the same player consecutively. The last touch is crossed to the opponent's area by crossing over the net or net trying to attack the opponent.

In the men's team for the smash technique, the indicator score 3 was 48.63% (392 times), score 2 was 32.87% (265 times), score 1 was 18.48 (149 times). The overall indicator block technique is a score of 3 of 11.64% (66 times), a score of 2 of 32.62% (185 times), a score of 1 of 55.73% (316 times). As

for the overall service indicator technique, namely a score of 3 of 15.77% (139 times), a score of 2 of 71.39% (629 times), a score of 1 of 12.82% (113 times). Data from the research on men's matches will be further explained in the table which has been summarized from the data obtained below.

**Table 1:** Data on the results of the Smash Contribution for each Men's Team

Team	Smash			Amount	Contribution
	Points (3)	Rally (2)	Dead (1)		
Yogyakarta City	85 (255) or 59.30%	72 (144) or 28.33%	31 (31) or 8.21%	430	59.30%
Sleman	89 (267) or 71.96%	40 (80) or 21.56%	24 (24) or 4.46%	371	71.96%
Bantul	88 (264) or 65.02%	58 (116) or 28.57%	26 (26) or 6.40%	406	65.02%
Gunung Kidul	79 (237) or 63.88%	50 (100) or 26.95%	24 (24) or 9.16%	371	63.88%
Kulon Progo	51 (153) or 65.94%	45 (90) or 38.79%	34 (34) or 4.65%	232	65.94%
Amount	392 x 3 = 1,176	265 x 2 = 530	149 x 1 = 149	1810	
Total Contribution	1.176 / 1.810 x 100% = 64.49%				

smash technique as a whole, the Sleman men's team had the greatest contribution, namely 71.96%. While the lowest contribution to the basic smash technique as a whole was found in the Yogyakarta City team at 59.30%. To generate points in volleyball game a smash is needed because a smash is a hard blow which is usually deadly because the ball is difficult to receive or return. Syafruddin (2011) <sup>[18]</sup> said that smashing requires high achievement and jumping ability so that success can be achieved brilliantly. In doing the smash

the athlete must have a good physical condition, namely: leg muscle explosive power is needed when making jumps, jumping endurance is needed when repulsing, jumping coordination is needed when hitting the ball and hitting power is needed when hitting the ball. In addition to the explosive power of the leg muscles in executing the smash, it is also supported by several factors such as: body flexibility, endurance, speed, abdominal muscle strength, reaction agility.

**Table 2:** Block Contribution Result Data for each Men's Team

Team	Blocks			Amount	Contribution
	Points (3)	Rally (2)	Dead (1)		
Yogyakarta City	15 (45) or 23.93%	34 (68) or 36.17%	75 (75) or 35.89%	188	23.93%
Sleman	14 (42) or 23.59%	40 (80) or 44.94%	56 (56) or 31.46%	178	23.59%
Bantul	12 (36) or 22.5%	35 (70) or 43.75%	54 (54) or 33.75%	160	22.5%
Gunung Kidul	12 (36) or 18.65%	46 (92) or 47.66%	65 (65) or 33.67%	193	18.63%
Kulon Progo	13 (39) or 23.63%	30 (60) or 18.18%	66 (66) or 40%	165	23.63%
Amount	66 x 3 = 198	185 x 2 = 370	316 x 1 = 316	804	
Total Contribution	198/ 804 x 100% = 24.62%				

block technique as a whole, the Yogyakarta City men's team has the biggest contribution, namely 23.93%. While the lowest contribution to the basic block technique as a whole was found in the Gunung Kidul team at 18.63%. Block can be done through active hand movements when blocking by moving the hand to the right or to the left. Hand movements can also be done passively, by reaching up without being

moved. On this basis, one of the dominant factors influencing the success of the blocking skill is physical condition, starting from the height of the jump when doing the block, in this case the explosive power of the leg muscles and arm muscle strength, coordination and agility also greatly affect the success of blocking.

**Table 3:** Service Contribution Result Data for each Men's Team

Team	Service			Amount	Contribution
	Points (3)	Rally (2)	Dead (1)		
Yogyakarta City	26 (78) or 21.60%	128 (256) or 70.91%	27 (27) or 7.47%	361	21.60%
Sleman	46 (138) or 32.01%	136 (272) or 63.10%	29 (29) or 7.51%	431	32.01%
Bantul	37 (37) or 28.53%	123 (246) or 63.73%	59 (59) or 32.06%	386	28.53%
Gunung Kidul	13 (39) or 11.78%	138 (276) or 83.38%	16 (16) or 4.83%	331	11.78%
Kulon Progo	17 (51) or 16.08%	123 (246) or 77.60%	20 (20) or 6.30%	317	16.08%
Amount	139 x 3 = 417	648 x 2 = 1,296	113 x 1 = 113	1826	
Total Contribution	417/ 1,826 x 100% = 22.83%				

service techniques as a whole, the Sleman men's team had the biggest contribution, namely 32.01%. Meanwhile, the lowest contribution to the basic service technique as a whole was found in the Gunung Kidul team at 11.78%. According to Wicaksono (2016) <sup>[20]</sup> Service in volleyball games apart from being a technique to start a rally in the game is also used as a weapon that can be used directly to kill the opposing team. Service is the first attack that hopes to immediately give pain

(ace).

Overall, the contribution of the smash, block and service techniques of each team, namely the Yogyakarta City men's team for smash technique was 19.76%, block was 23.93%, and service was 21.60%. The Sleman team for smash technique was 71.96%, block was 23.59%, and service was 32.01%. The Bantul team for smash technique was 65.02%, block was 22.5%, and service was 28.53%. The Gunung

Kidul team for smash technique was 63.88%, block was 18.63%, and service was 11.78%. The Kulon Progo team for smash technique was 65.94%, block was 23.63%, and

service was 16.08%. The results of the research in the table above can also be seen in the following diagram.

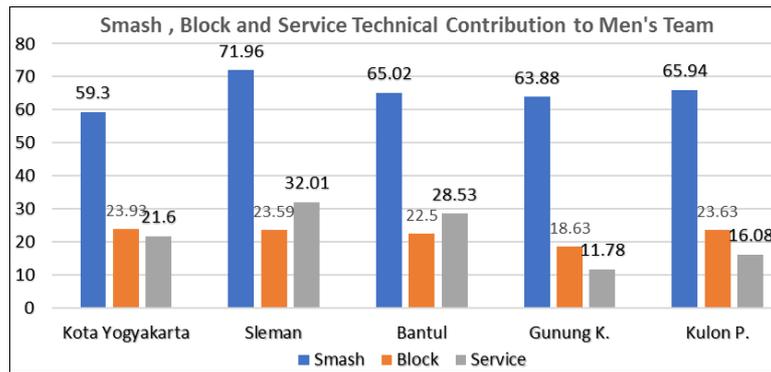


Fig 1: The contribution of smash, block and service techniques to each men's team

From the results of the data analysis above, we can describe that the contribution of the basic techniques that greatly influence point taking in volleyball matches is the basic smash technique, which is equal to 64.49% of the block technique is 24.62% and the service technique is 22.83%. The basic technical contribution can be seen in the diagram below.

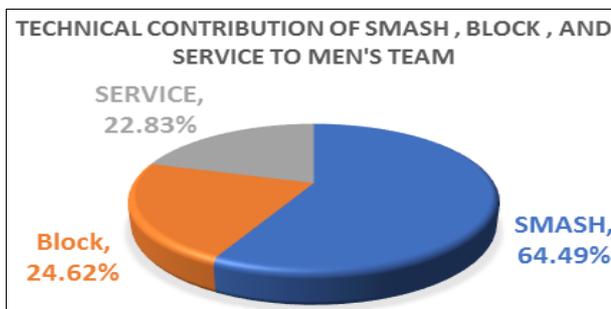


Fig 2: Contribution of Smash, Block and Service Techniques to the Men's Team Overall

2. Girls volleyball match

The volleyball competition at the 2022 DIY Regional Student Sports Week championship greatly affects the technical and non-technical experience that athletes will gain. A lot of competing experience will shape physical, technical or skill and mental abilities. The technical abilities or skills examined in this study are smash, block and service contributions.

In the women's team, the overall indicator for the smash technique is an indicator score of 3 of 40.62% (351 times), score of 2 of 41.55% (359 times), score of 1 of 17.82% (43 times). The overall indicator block technique is a score of 3 of 11.31% (61 times), a score of 2 of 38.58% (208 times), a score of 1 of 50.09% (270 times). As for the technical service indicators as a whole, namely a score of 3 of 15.76% (125 times), a score of 2 of 73.39% (582 times), a score of 1 of 10.84% (86 times). Data results princess match research will be explained more carry on table that has been summarized from the data that has been obtained in lower this.

Table 4: Smash Contribution Result Data for each Women's Team

Team	Smash			Amount	Contribution
	Points (3)	Rally (2)	Dead (1)		
Yogyakarta City	103 (309) or 63.44%	69 (138) or 28.33%	40 (40) or 8.21%	487	63.44%
Sleman	86 (258) or 77.01%	58 (116) or 17.31%	19 (19) or 5.67%	335	77.01%
Bantul	80 (240) or 58.25%	72 (144) or 34.95%	28 (28) or 6.79%	412	58.25%
Gunung Kidul	49 (147) or 46.37%	73 (146) or 46.05%	24 (24) or 7.57%	317	46.37%
Kulon Progo	33 (99) or 31.32%	87 (174) or 55.06%	43 (43) or 3.60%	316	31.32%
Amount	351 x 3 = 1,053	359 x 2 = 718	43 x 1 = 43	753 (1,814)	
Total Contribution	1.053 / 1.814 x 100% = 58.04%				

The Sleman women's team made the biggest contribution to the basic smash technique as a whole, namely 77.01%. While the lowest contribution to the basic smash technique as a whole was in the Kulon Progo team at 31.32%. Today's modern volleyball game, the smash has developed a lot and has many variations including open smash, semi smash, pull smash, and what is currently popular is the back smash. In the

implementation of the smash there are several factors that influence. While the technical factors include the position of the feet, the position of the arm at impact with the ball and the view. Therefore, physical condition, technique, tactics and mental factors are very decisive for a volleyball player to support high achievement.

Table 5: Block Contribution Result Data for each Women's Team

Team	Blocks			Amount	Contribution
	Points (3)	Rally (2)	Dead (1)		
Yogyakarta City	11 (33) or 15.49%	68 (136) or 63.84%	44 (44) or 20.65%	213	15.49%
Sleman	17 (51) or 33.33%	28 (56) or 36.60%	46 (46) or 30.06%	153	33.33%
Bantul	17 (51) or 27.71%	37 (74) or 40.21%	59 (59) or 32.06%	184	27.71%
Gunung Kidul	9 (27) or 16.46%	37 (74) or 45.12%	63 (63) or 38.41%	164	16.46%
Kulon Progo	7 (21) or 13.54%	38 (76) or 49.03%	58 (58) or 37.41%	155	13.54%
Amount	61 x 3 = 183	208 x 2 = 416	270 x 1 = 270	539 (869)	
Total Contribution	183/ 869 x 100% = 21.05%				

The overall contribution of the basic block techniques to the Sleman women's team contributed the most, namely 33.33%. While the lowest contribution to the basic service technique as a whole was found in the Kulon Progo team at 13.54%. Block techniques both individually and as a team must be properly trained. Block techniques can be performed by an individual alone, or in combination with other forward players and form a two-person or three-person block (McKeever, *et al.*, 2018)

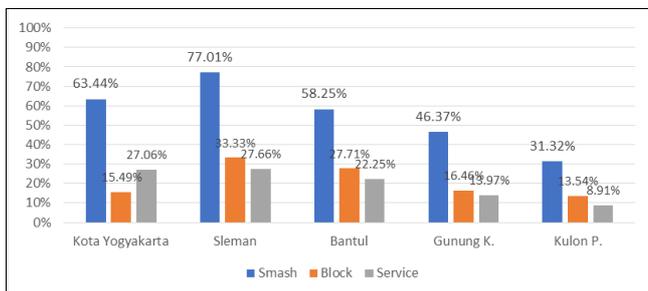
[11]. One of the dominant factors influencing the success of the blocking skill is physical condition, starting from the height of the jump when doing the block, in this case the explosive power of the leg muscles and arm muscle strength, coordination and agility also greatly affect the success of blocking.

**Table 6:** Data on Service Contribution Results for each Women's Team as a whole

Team	Service			Amount	Contribution
	Points (3)	Rally (2)	Dead (1)		
Yogyakarta City	35 (105) or 27.06%	129 (258) or 66.49%	25 (25) or 6.44%	388	27.06%
Sleman	38 (114) or 27.66%	138 (276) or 66.99%	22 (22) or 5.33%	412	27.66%
Bantul	27 (81) or 22.25%	135 (270) or 74.17%	13 (13) or 3.57%	364	22.25%
Gunung Kidul	16 (32) or 13.97%	93 (186) or 81.22%	11 (11) or 4.80%	229	13.97%
Kulon Progo	9 (27) or 8.91%	87 (261) or 86.13%	15 (15) or 4.95%	303	8.91%
Amount	125 x 3 = 375	582 x 2 = 1,164	86 x 1 = 86	793 (1,625)	
Total Contribution	375/ 1.625 x 100% = 23.07%				

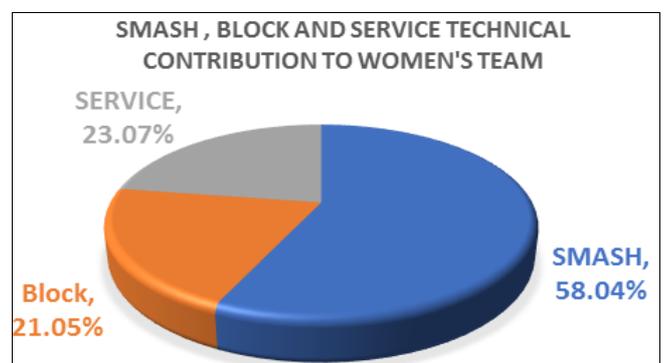
Service techniques as a whole for the Sleman women's team had the biggest contribution, namely 27.66%. While the lowest contribution to the basic service technique as a whole was found in the Kulon Progo team at 8.91%. The contribution of service techniques to volleyball is getting points through the opening stroke to start a game. With the current development of volleyball, serving is one of the most important first attacks. A good serve sequence is one that can immediately kill your opponent, then makes it difficult for your opponent to counterattack properly. Service is the first step that will determine the ability of a team to carry out the initial attack to get value for a team to win.

Overall the contribution for the women's team, namely the Yogyakarta City team for smash technique was 63.44%, block was 15.49%, and service was 27.06%. The Sleman team for smash technique was 77.01%, block was 33.33%, and service was 27.66%. The Bantul team for smash technique was 58.25%, block was 27.71%, and service was 22.25%. The Gunung Kidul team for smash technique was 46.37%, block was 16.46%, and service was 13.97%. The Kulon Progo team for smash technique was 31.32%, block was 13.54%, and service was 8.91%. The results of the research in the table above can also be seen in the following diagram.



**Fig 3:** Smash, Block, and Service Technical Contribution to each Women's Team

From the results of the data analysis above, we can describe that the contribution of the basic technique that greatly influences the point taking in volleyball matches is the basic smash technique, which is equal to 58.04% of the block technique is 21.05% and the service technique is 23.07%. The basic technique contribution can be seen in the diagram below



**Fig 4:** Smash, Block and Service Technical Contribution to the Women's Team Overall

**Conclusion**

Based on results study and income analysis data which has conducted, the following conclusions are obtained.

1. Contribution of smash, block, and service techniques in volleyball matches at the 2022 DIY Regional Student Sports Week (POPDA) for the men's team, namely smash of 64.49%, block of 24.62% and service of 22.83%, while for the women's team smash was 58.04%, block was 21.05% and service was 23.07%.
2. The contribution of the smash, block and service techniques of each team, namely the Yogyakarta City men's team for smash technique was 59.30%, block was 23.93%, and service was 21.60%. The Sleman team for smash technique was 71.96%, block was 23.59%, and service was 32.01%. The Bantul team for smash technique was 65.02%, block was 22.5%, and service was 28.53%. The Gunung Kidul team for smash technique was 63.88%, block was 18.63%, and service was 11.78%. The Kulon Progo team for smash technique was 65.94%, block was 22.63%, and service was 16.08%. While the contribution for the women's team, namely the Yogyakarta City team for smash technique was 63.44%, block was 15.49%, and service was 27.06%. The Sleman team for smash technique was 77.01%, block was 33.33%, and service was 27.66%. The Bantul team for smash technique was 58.25%, block was 27.71%, and service was 22.25%. The Gunung Kidul team for smash technique was 46.37%, block was 16.46%, and service was 13.97%. The Kulon Progo team for smash technique was 31.32%, block was 13.54%, and service was 8.91%.

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