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Decentralization and Public health services delivery in Juba County, Central Equatorial State, South Sudan. A cross-sectional study.

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Abstract

Background
Decentralization aims to improve efficiency, accountability, and access to essential health services through the transfer of decision-making authority from central to local governments. The study sought to determine the effects of decentralization on public health services delivery in Juba County, Central Equatorial State, South Sudan.

Methodology
A descriptive research design was employed, involving 150 respondents drawn from public health users, health students, staff, partners, and local authorities. Data were collected using structured questionnaires and analyzed through descriptive statistics, Pearson correlation, and regression analysis using SPSS Version 24.

Results
The majority (60%) were aged between 18 and 30 years, and 57% of respondents were female. Administrative decentralization had a moderate positive and significant correlation with public health service delivery ($r = 0.506$, $p < 0.05$), accounting for 31.3% of the variance ($R^2 = 0.313$). Fiscal decentralization showed a strong positive relationship ($r = 0.690$, $p < 0.05$), explaining 47.6% of the variation ($R^2 = 0.476$), while political decentralization demonstrated the strongest positive correlation ($r = 0.711$, $p < 0.05$) and explained 50.5% of the variance ($R^2 = 0.505$).

Conclusion
The study established that decentralization positively influences health service delivery when adequately supported by local capacity and fiscal accountability.

Recommendation
The government should strengthen local governance structures, increase funding for county health systems, enhance transparency, and promote participatory decision-making to achieve equitable and efficient public health services.

Keywords: *Decentralization, Public health service delivery, Juba County, South Sudan.*
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Background

Decentralization has progressively been adopted worldwide in the past four decades as a counter to unrestricted use of power by central elites. A 1999 study by the World Bank estimated that between 80-100% of the world's countries were implementing decentralization in one form or another. Underlying many of the reforms that have captured headlines around the world has been a widespread movement towards governmental decentralization and the enhancement of local government. In Africa, several governments have adopted the combination of devolution, delegation, and de-concentration in making policy and instigating choices regarding decentralization. Countries such as Nigeria, Ethiopia, Ghana, Kenya, Cameroon, South Africa, the Democratic Republic of Congo, and lately South Sudan have embraced decentralization or devolution in their governance systems.

The Sequential Theory of Decentralization will guide this research, which looks into the link between decentralization and health service delivery. Falleti's sequential theory of decentralization follows a succession of governmental reforms (2004). Depending on the sort of authority devolved, Falleti (2004) divides decentralization policies into three categories: administrative, fiscal, and political. Slater (1989), Faguet (2012), and others have pointed out that 'decentralization' is polysemic, meaning very different

things to different people and in different countries where it has been implemented.

The conceptual perspective of this study is grounded in the theoretical premise that decentralization is a multi-dimensional construct whose effectiveness in improving public service delivery is contingent on the synergistic functioning of its core components (Rondinelli, 1981). This study specifically adopts the widely recognized framework that categorizes decentralization into three distinct but interrelated dimensions: administrative, fiscal, and political (Cohen & Peterson, 1999). The central perspective is that the transfer of responsibilities, resources, and authority to local governments in Juba County should, in theory, lead to more responsive, efficient, and equitable public health services by aligning decision-making closer to the point of service delivery (Faguet, 2014).

The administrative decentralization dimension posits that delegating authority over personnel, daily operations, and management to local health authorities increases managerial efficiency and accountability, potentially leading to improved service quality and responsiveness to local needs (Mills et al., 1990). The fiscal decentralization dimension holds that when local units have meaningful control over financial resources through both local revenue generation and discretionary budgeting, they are better equipped to allocate funds according to local health priorities, thereby enhancing the availability and sustainability of services (Bird & Vaillancourt, 1998) Finally, the political decentralization dimension suggests that empowering local communities and their representatives through participation in health governance fosters greater accountability and ensures that services reflect community needs, ultimately improving utilization and health outcomes.

This study will empirically test this conceptual perspective by examining the relationship between each of these dimensions and key indicators of public health service delivery in Juba County. By investigating these linkages, the research seeks to determine which dimension(s) of decentralization are most critically associated with effective service delivery in the unique post-conflict context of South Sudan, thereby contributing valuable evidence to both theoretical debates and practical policy formulation.

Methodology

Research design

The study was carried out using a cross-sectional research approach. The association between decentralization and public health service delivery in Juba County has been investigated using both quantitative and qualitative methods.

Target population

Juba County has an estimated population of about 523,700 people in 2022, according to the UN Office of Coordination of Humanitarian Affairs. This considered a target population of 280 that included local authorities' officials, health workers, health partners, health students, and public health users/beneficiaries living and working in the county.

Sample size and selection

Yamane's technique for sample size determination will be utilized to come up with a sample size of 190 responders from the target population of 280.

Table 1: Sample size selection and sampling technique

Category	Strata Target Population	Method	Population	Sample Size	Sampling Technique
Local Authorities	Juba County Executives County	KII	10	10	Purposive Sampling
Students	Health Students	KII	10	10	Purposive Sampling
Public Health Services Partners	NGOs/UN agencies /CBOs Public Health Services Staff	KII	10	10	Purposive Sampling
Health Workers	Health Facilities Staff	KII	10	10	Purposive Sampling
Public Health Services Users	Health Users/Beneficiaries	Survey	240	150	Random Sampling
Total	-	-	280	190	-

Source: Primary data; 2024, Yamane (1973).

The sample size was determined by adopting Yamane's (1973) sample size selection approach. According to Yamane's formula, sample size is determined by:

$n = \underline{N}\ 1+N\ (e)^2$

Where: n- is a sample size; N- Is total population; and e- Is tolerable error.

Given the target population of 280, and the margin of error of 5%, the sample size can be calculated as below.

$n= \underline{280}$

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$1 + 280 * (0.05)^2$
n= 280
$1 + (280 * 0.0025) = 190$

Sampling techniques

The respondents were recruited using basic random sampling and selective sampling techniques. Simple random sampling. Simple random sampling was used to choose participants for the study from among the operational management employees of Juba County health facilities, especially primary health centers, as well as public health service users/beneficiaries.

Because the population is small, and the cases in the strata possess crucial information due to their knowledge and experience about the subject under study, the purposive sampling technique was used to select key informants, who included Juba County Executives and top management staff at Juba County primary health centers This technique was used by picking the specific respondents who have been considered to be more informed about issues under study because of their uniqueness in terms of experience and seniority.

Data collection methods and instruments

Owing to the research questions and objectives of this study, both qualitative and quantitative data were collected from both primary and secondary sources with the help of questionnaires and key informant interviews.

Data collection methods

Questionnaire survey

This method of data collection was used to collect data from sampled respondents. The questionnaire survey method of data collection was preferred because it is a simple, straightforward, and cost-effective data collection method.

Data collection instruments

Self-administered questionnaire

The questions were filled out in such a way that most of them were options from which to choose based on their preferences and understanding of the subject area. The questionnaires were semi-structured, with closed-ended items. Questionnaires were utilized in the study because they allowed the researchers to reach a large number of people in a short amount of time and provided accurate data because respondents answered the questions in their own mood, unaffected by the researcher's presence. After an agreed period with the respondents, the researcher collected completed questionnaires for coding and analysis.

Interview guide

Data quality control

Validity of research instruments

A pilot study was conducted, and respondents were given questionnaires to see if the responses provided were appropriate for the topics posed and were not ambiguous. To evaluate the validity of the set questions in obtaining the anticipated findings, the researcher randomly selected 10 respondents from the study area. The researcher confirmed whether the prepared questionnaires were valid and reliable for data collection after the pilot test. To determine the authenticity of the content, a Content Validity Index (CVI) was calculated on the questionnaire administered and the interview guide using the formula:

Content Validity Index = Total number of items rated as valid
Total number of items on the instrument

According to Bakabbulindi (2004), a CVI of 0.7 or higher is considered valid for a data collection instrument.

Reliability

Cronbach's Alpha Dependability Coefficient for Likert-Type Scales test was used to evaluate the reliability of quantitative data. Cronbach's alpha is a coefficient of reliability in statistics. It is widely employed as a measure of a psychometric test score's internal consistency or reliability for a group of examinees. The instrument was subjected to a pre-test in which ten people from the general public who were not part of the sample size were utilized to test the questionnaire's reliability.

Data analysis

In order to process the data, it was collected, edited, sorted, and coded in preparation for analysis. The quantitative data were analyzed using descriptive statistics such as frequencies, percentages, means, and standard deviation, and presented in the form of tables and charts using Statistical Package for Social Sciences (SPSS) version 21 for Windows.

To examine the relationship between the independent (administrative decentralization, fiscal decentralization, and political decentralization) and dependent (public health services delivery) variables, at the 0.05 level of significance, Pearson's Correlation was used, and this helped to measure the degree and direction of the relationship between the variables. Values of correlation between +1.0 and -1.0 reflected a positive or negative relationship, and the value 0

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reflected no relationship. The value obtained was compared with the critical value from Pearson's correlation table.

Ethical considerations

The study exercised utmost caution while administering the data collection instruments to the respondents to ensure their rights and privacy were upheld. Issues related to proper researcher/participant relation, confidentiality, trust, autonomy, respect for the person, beneficence and no maleficence, justice, gender sensitivity, and inclusivity, among other ethical and human considerations, were taken into account during the study.

Results

Demographic data

Figure 1: showing the gender of the respondents

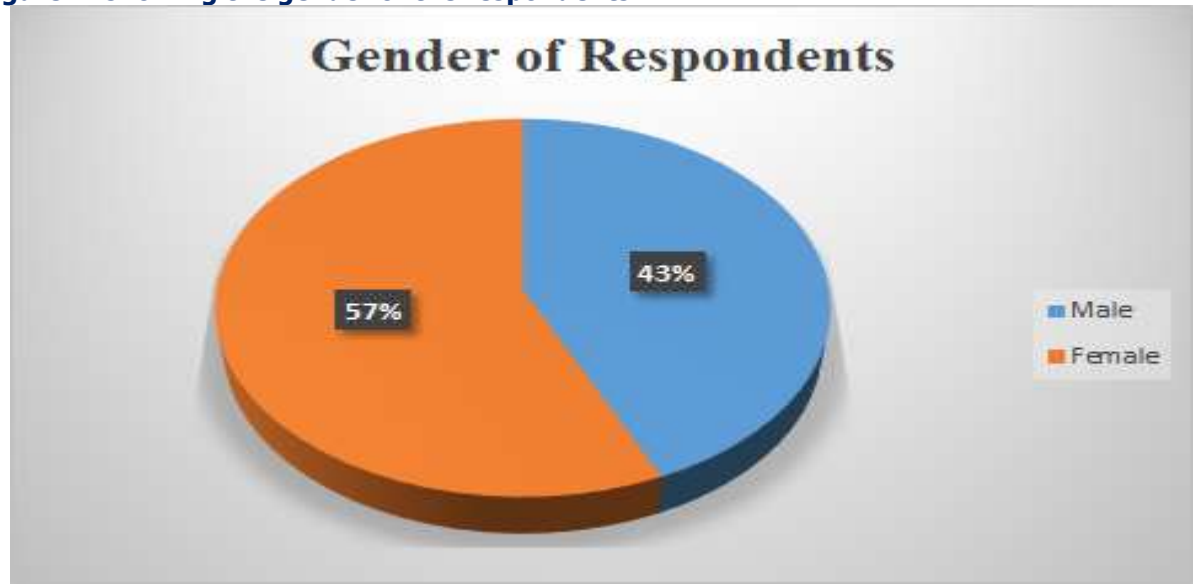

Figure 1 indicates that the studies have been dominated by female respondents (57%) and 43% by male respondents.

Figure 2: Showing the marital status of respondents

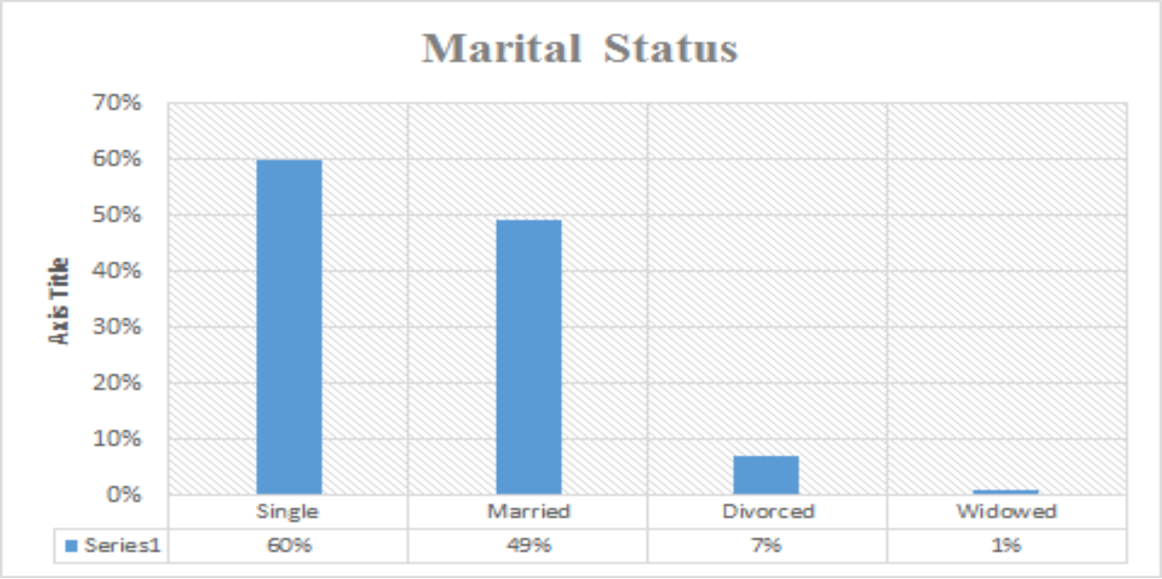

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Figure 2 shows 49% of the respondents were married and 43% were single. 7% of the respondents were divorced, and only 1 % widowed.

Figure 3: Showing the age bracket of the respondents

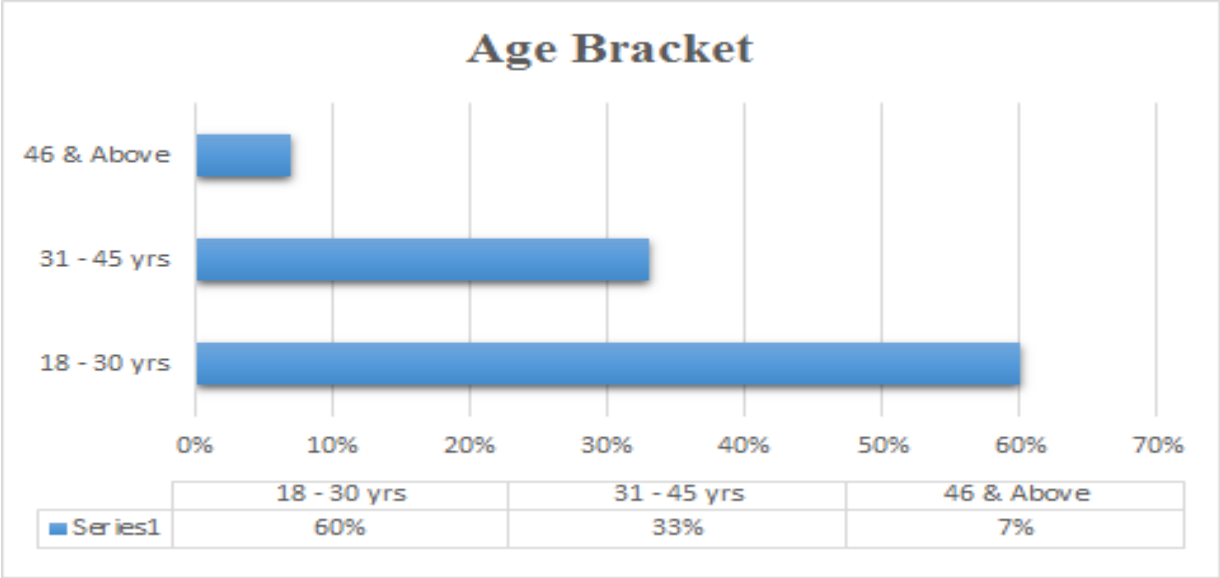

Figure 3 indicates that the age category from 18 – 30 years had the majority of respondents (60%), while the respondents from 30 – 45 years followed with 33%. The respondents from the age bracket of 46 years and above were only 7%.

Table 2: Showing the educational levels of the respondents

S/No	Education Level	Frequency	Percentage
01	No Education	16	11%
02	Primary Level	25	17%
03	Secondary Level	53	35%
04	Tertiary Level	24	16%
05	University Level	32	21%
	Cumulative Total	150	100%

Table 2 indicates that 45% of the respondents have Diplomas, 33% have attained Degrees, while those with post-graduate qualifications have 15%, and those who only ended with their studies at secondary level were 7%. The majority of the respondents were secondary school leavers (35%), followed by respondents who reached university with 21%. The respondents who reached the primary level were 17% and those with no formal education were 11%.

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Figure 4: Respondents' occupation

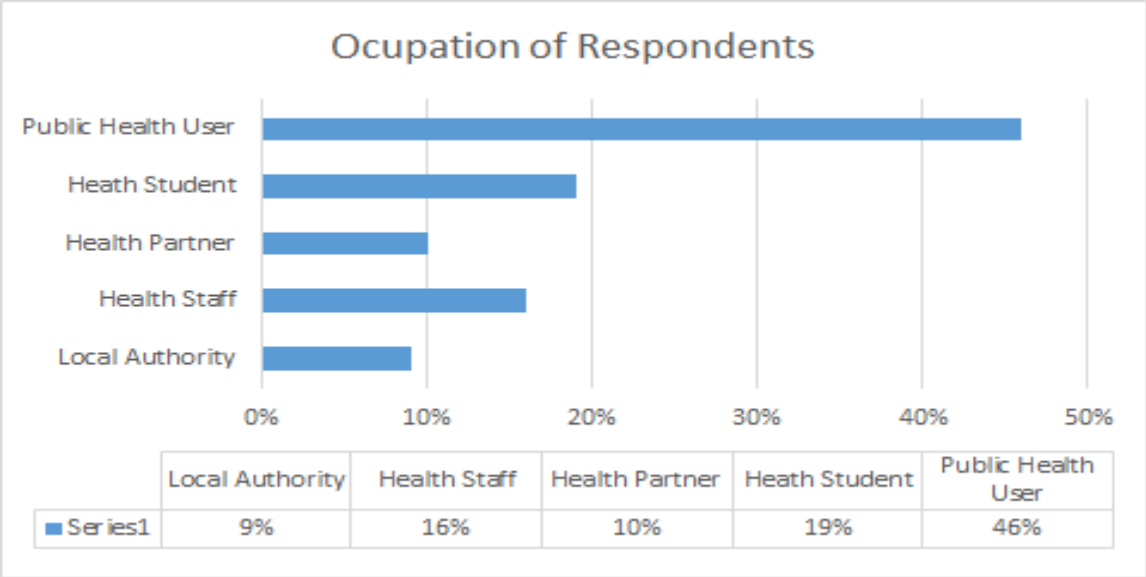

Figure 4 shows that he majority of respondents were public health users with 46%, followed by health students (19%), health staff scored 16%, health partners with 10% and finally, by the local authorities at 9%. Juba County has no referral hospital and therefore, its citizens are referred to Juba Teaching Hospital for further health management.

Administration decentralization

Table 3: Showing findings of the findings on statements on administrative decentralization

S/N.	Statements	Percentage of Responses					
		Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*	TOTAL
01	The local authorities of Juba County have the authority to obtain/request for required resources to implement their planned activities	8%	13%	18%	56%	28%	100%
02	Clean water points are maintained by the Boma administration	11%	21%	19%	31%	18%	*100%*
03	There are trained County committees to supervise and monitor the performance of State, national health projects implemented at the county level.	10%	20%	14%	39%	17%	*100%*
04	Boma health committees are trained and well-functioning	8%	17%	17%	37%	21%	*100%*
05	Waste management function is done by the Boma administration	*18%*	*18%*	*23%*	*27%*	*14%*	*100%*

Table 3 shows that 56% of the respondents agreed with the statement that *"the local authorities of Juba County have the authority to obtain/request for required resources to implement their planned activities,"* while 28% strongly agreed. 18% were neutral, 13% disagreed, and 8% strongly disagreed.

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31% of the respondents (majority) agreed that *"Clean water points are maintained by Boma administration,"* 18% strongly agreed, while 19% were non-aligned. 21% disagreed, and 11% strongly disagreed.

On the statement that "there are trained county committees to supervise and monitor the performance of state, national health projects implemented at the county level," 39% agreed and 17% strongly agreed.
37% agreed that *"Boma health committees are trained and well-functioning,"* 21% strongly agreed, 17% neutral, 17% disagreed, and only 8% strongly disagreed.
Finally, with the assertion that *"Waste management function is done by Boma administration,"* 27% agreed, 14% strongly agreed, and 23% had no opinion. In contrast, 18% disagreed and strongly disagreed.

Correlation analysis between administrative decentralization and public health service delivery.

To determine both the significance of the relationship between the variables and the degree of their association, a correlation analysis was performed. The correlation was done to establish the extent to which Administrative Decentralization affects public health service delivery. The findings show that the relationship between the two variables was significant ($r = 0.506$, $p < 0.05$). However, the coefficient of correlation from Pearson's product-moment indicated that the relationship between the variables was strong and positive.

Table 4: Correlation between Administrative Decentralization and public health service delivery.

		Public health service delivery	Administrative decentralization
Public health service delivery	Pearson Correlation	1	.506**
	Sig. (2-tailed)		.000
	N	150	150
Administrative Decentralization	Pearson Correlation	.506**	1
	Sig. (2-tailed)	.000	
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed)

Regression between administrative decentralization and public health service delivery

Regression analysis was conducted to determine how the dependent and independent variables related to each other and their level of significance. Shows the model summary of the results. From the results, there was a high relationship between the dependent and independent variables, as the coefficient of determination, where r, was ($r = 0.313$). The R-square shows that Administrative decentralization used in the study accounted for 31.3% of the variance in public health service delivery.

Fiscal Decentralization and Public health service delivery

Table 5: Showing the findings for fiscal decentralization

S/N.	Statements	Percentage of Responses					
		Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*	TOTAL
01	The County authorities collect taxes from every business	*8%*	*5%*	*16%*	*32%*	*39%*	*100%*
02	The revenue (taxes) raised by the County is used for improving service delivery to the County communities.	*6%*	*9%*	*14%*	*10%*	*40%*	*100%*
03	The majority of the people in the County have expressed dissatisfaction with the misuse of funds provided to improve the quality of services provided by the County.	*9%*	*18%*	*13%*	*29%*	*31%*	*100%*
04	Most of the County's activities are funded by donors/partners	*5%*	*5%*	*17%*	*23%*	*50%*	*100%*

05	Corruption affects funds allocated or granted to promote the development of the County	*3%*	*7%*	*18%*	*23%*	*49%*	*100%*
06	The county health budget is always sufficient to satisfy health demand	*19%*	*16%*	*21%*	*32%*	*12%*	*100%*

Table 5 reveals that 39% strongly agreed with the statement that *"the County authorities collect taxes from every business,"* 32% agreed, 16% neutral, only 5% disagreed, and 8% strongly disagreed.
40% of respondents strongly agreed with the contention that *"the revenue (taxes) raised by the County is used to improve service delivery to the County communities,"* 40% strongly agreed and 10% agreed, 14% were neutral, 9% disagreed, and only 6% strongly disagreed.

On the allegation that *"the majority of the people in the County have expressed dissatisfaction with the misuse of funds provided to improve the quality of services provided by the County,"* 31% of respondents strongly agreed and 29% agreed. 13% of the respondents were neutral, 18% disagreed, and only 9% strongly disagreed.
In regards to the observation that *"most of the County's activities are funded by donors/partners,"* 50% of respondents have strongly agreed, 23% agreed, and only 17% were neutral. Only 5% disagreed, and 5% strongly disagreed.

On the charge that *"corruption affects funds allocated or granted to promote development of the County,"* 32% agreed and 12% strongly agreed, with 21% with no idea. However, 16% disagreed and 19% strongly disagreed.
Finally, 32% of respondents agreed that "the county health budget is always sufficient to satisfy health demand," 12% strongly agreed, 21% were neutral, 16% disagreed, and 19% strongly disagreed.

Correlation between fiscal decentralization and Public health service delivery

The study also sought to establish if there is a relationship between fiscal decentralization and public health service delivery. Results show that the results obtained from the correlation analysis indicate that there existed a significant relationship ($r = 0.690$, $p < 0.05$), which also indicates that the variables had a relatively positive correlation.

Table 6: Correlation between fiscal decentralization and public health service delivery

		Public health service delivery	Fiscal decentralization
Public health service delivery	Pearson Correlation	1	.690**
	Sig. (2-tailed)		.000
	N	150	150
Fiscal decentralization	Pearson Correlation	.690**	1
	Sig. (2-tailed)	.000	
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed).

Regression between fiscal administration and public health service delivery.

The use of regression analysis was to determine how the dependent and independent variables related to each other and their level of significance. The results show the model summary of the results. From the results, there was a relatively strong relationship between the dependent and independent variables, as the coefficient of determination, r, was (r = 0.476). The R-squared shows that Fiscal Decentralization used in the study accounted for 47.6% of the variance in Public health service delivery.

Table 7: Model Summary for the fiscal decentralization model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690[a]	.476	.600	2.39244
a. Predictors: (Constant), Fiscal Decentralization.			Public health service delivery.	

Table 8: Coefficient Analysis between Fiscal decentralization and public health service delivery.

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	11.125	3.204		3.473	.001
	Fiscal decentralization	.750	.104	.778	10.367	.000

a. Dependent Variable: public health service delivery.

Table 8 shows the coefficient analysis for the independent variables in the study. As shown, the study reveals that Fiscal decentralization had a positive and significant effect on public health service delivery (β = .750, p = .000). This means that an improvement in fiscal decentralization leads to an improvement in public health service delivery and vice versa. Therefore, the resulting regression model is public health service delivery = 11.125 + 0.750 Fiscal decentralization.

Political Decentralization and Public Health Service Delivery

Table 9: Showing findings for political decentralization

S/N.	Statements	Percentage of Responses					
		Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*	TOTAL
01	Communities select their leaders at the local levels to build trust and to promote participatory community development.	*5%*	*8%*	*16%*	*43%*	*28%*	*100%*
02	The interference of the central government at the local level is very high, and it affects service delivery.	*7%*	*21%*	*21%*	*30%*	*21%*	*100%*
03	The voices of citizens are the basis for decision-making at the local level.	*0%*	*7%*	*14%*	*38%*	*38%*	*100%*
04	Local citizens hold local decision-makers accountable for their decisions/actions.	*3%*	*11%*	*18%*	*36%*	*32%*	*100%*
05	Community members always choose their local leaders in free and fair elections	*7%*	*9%*	*20%*	*34%*	*30%*	*100%*
06	In the County, it's easy for community members to raise critical issues with the relevant authorities.	*8%*	*16%*	*27%*	*33%*	*16%*	*100%*

Table 9 indicates that 28% of respondents strongly agreed with the statement that *"communities have to select their leaders at the local levels to build trust and to promote participatory community development,"* 43% agreed, and 16% were neutral. Nonetheless, 8% disagreed, and 5% strongly disagreed.

On the claim that *"the interference of the central government at the local level is very high, and it affects service delivery,"* 21% strongly agreed, 30% agreed, 21%

neutral, while also 21% disagreed and 7% strongly disagreed.

32% of the respondents strongly agreed with the statement that *"the voices of citizens are the basis for decision-making at the local level,"* 36% agreed, 14% neutral, 7% disagreed, and none strongly disagreed.

With the contention that "*local citizens hold local decision-makers accountable for their decisions/actions*," 32% agreed and 36% strongly agreed. However, 18% were neutral, 11% disagreed, and only 3% strongly disagreed.

30% of respondents strongly agreed with the claim that *"community members always chose their local leaders in free and fair elections,"* 34% agreed, and 20% were neutral. On the other side, 9% disagreed and 7% strongly disagreed.

Lastly, on the assumption that *"in the County, it's easy for community members to raise critical issues to the relevant authorities,"* 33% agreed, 16% strongly agreed, and 27% had no opinion. However, 16% disagreed and 8% strongly disagreed.

Correlation between political decentralization and public health service delivery

The study also sought to establish that public health service delivery and Political decentralization had a significant relationship. The results show that the results obtained from the correlation analysis indicate that there existed a significant relationship ($r = 0.711$, $p < 0.05$), which also indicates that the variables had a strong positive correlation.

Table 10: Correlation between political decentralization and public health service delivery.

		Public health service delivery	Political decentralization
Public health service delivery	Pearson Correlation	1	.711**
	Sig. (2-tailed)		.000
	N	150	150
Political decentralization	Pearson Correlation	.711**	1
	Sig. (2-tailed)	.000	
	N	150	150

**. Correlation is significant at the 0.01 level (2-tailed).

Regression analysis of political decentralization and public health service delivery.

The use of regression analysis aims to determine how the dependent and independent variables relate to each other and their level of significance. This was also aimed at determining the extent to which the dependent variable was influenced by each independent variable to determine the level of significance of each variable. From the results, there was a high relationship between the dependent and independent variables, as the coefficient of determination, r, was ($r = 0.505$). The R-square shows that goal setting used in the study accounted for 50.5 % of the variance in Public health service delivery.

Model Summary

Table 11: Model summary for political decentralization

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.711[a]	.505	.376	2.98686

a. Predictors: (Constant), Goal setting

Table 12: ANOVA between Political decentralization and public health service delivery.

ANOVA[a]

Model		Sum of Squares	df		Mean Square	F	Sig.
1	Regression	391.380		1	391.380	43.870	.000[b]
	Residual	624.495		101	8.921		
	Total	1015.875		102			

a. Dependent Variable: public health service delivery

b. Predictors: (Constant), Political decentralization

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Table 12 presents the analysis of variance (ANOVA) results for the regression model. From the table, the F-statistic was significant since the p-value falls below the 0.05 level of significance (F = 43.870, p= 0.000). This means that the model was fit to test the relationship between political decentralization and public health service delivery.

Table 13: Coefficient Analysis for political decentralization

Coefficients

Model 1	(Constant)	Unstandardized Coefficients B / Std. Error	Standardized Coefficients Beta	t	Sig.
		16.378 / 4.217		3.884	.000
	Political decentralization	.915 / .138	.621	6.623	.000

a. Dependent Variable: Public health service delivery.

Table 13 shows the coefficient analysis for the independent variables in the study. As shown, the study reveals that it had a positive and significant effect on public health service delivery (β = 0.915, p = .000). This means that any change in political decentralization leads to an improvement in public health service delivery and vice versa. Therefore, the resulting model is Public health service delivery = 16.378 + 0.915 political decentralization.

Public Health service delivery

Table 14: Showing findings for Public health services delivery

S/N.	Statements	Percentage of Responses					
		Strongly disagreed	*Disagree*	*Neutral*	*Agree*	*Strongly agree*	TOTAL
01	This PHCC/PHCU is easily accessible to community members.	*6%*	*9%*	*13%*	*43%*	*29%*	*100%*
02	There is better treatment at this PHCC/PHCU	*5%*	*15%*	*20%*	*39%*	*21%*	*100%*
03	The majority of citizens are pleased with the level of health care provided by this health Centre.	*5%*	*10%*	*25%*	*41%*	*19%*	*100%*
04	The health workers do not take bribes from us in order to get treatment.	*25%*	*14%*	*14%*	*25%*	*22%*	*100%*
05	The health service providers are constantly ready to supply any type of health service to the people who need it.	*4%*	*11%*	*20%*	*47%*	*18%*	*100%*
06	The necessary drugs and health equipment are readily available and in good working conditions	*7%*	*14%*	*25%*	*40%*	*14%*	*100%*
07	The citizens get adequate health services anytime they need them	*9%*	*19%*	*23%*	*37%*	*12%*	*100%*
08	The majority of citizens seek health services from private clinics	*6%*	*13%*	*29%*	*35%*	*17%*	*100%*

Table 14 shows that 29% of respondents have strongly agreed that "*The public health hospital/Centre/unit is easily accessible by community members*," 43% agreed, 13% no idea, 9% disagreed, and 6% strongly disagreed.

With the statement that, *"there is better treatment at this health hospital/Centre/unit,"* 21% strongly agreed, 39% disagreed, and 20% neutral. In contrast, 15% disagreed, and 5% strongly disagreed.

41% of respondents agreed that "*Majority of citizens are pleased with the level of health care provided by this health Centre*," 19% strongly agreed, and 25% were neutral. 10% disagreed, and 5% strongly disagreed.

22% strongly agreed with the statement that "*The health workers do not take bribes from us to get treatment*," 25% agreed, and 14% neutral. Conversely, 14% disagreed and 25% strongly disagreed.

On the statement that *"The health service providers are constantly ready to supply any type of health service to the people who need it,"* 18% strongly agree, 47% agree, 20% neutral, while 11% disagree, and 4% strongly disagree.

40% of respondents agreed with the statement that *"The necessary drugs and health equipment are readily available and in good working conditions."* 14% strongly agreed, 25% had no opinion, 14% disagreed, while 7% strongly disagreed.

Lastly, the statement that "*Majority of citizens seek health services from private clinics*," 17% strongly agreed, 35% agreed, and 29% neutral. Contrarily, 13% disagreed and 6% strongly disagreed.

Discussion of results

Administrative decentralization

De-concentration

As shown in the response, 56% of the respondents agreed that the local authorities of Juba County have the authority to obtain/request for required resources to implement their planned activities, though 28% strongly disagreed. This implies that to a greater extent, Juba County has de-concentrated powers to the Payam and Boma levels. However, the 39% who agreed and 20% disagreed that there are trained County committees to supervise and monitor the performance of State, national Health projects implemented at the county level, reveals that trained County committees exist, but they may not have been effective or functional. Therefore, even if de-concentration exists to the largest extent at the County, supervision and measurement of performance of decentralized powers at the grassroots is weak or inadequate.

Delegation

The findings revealed that 31% of the respondents (majority) agreed and 18% strongly agreed that Boma administrators manage and maintain clean water points. But not in all Bomas, as 21% disagreed and 11% strongly disagreed. Secondly, with the assertion that "," the 27% (majority) who agreed that waste management function is done by Boma administration suggests that, indeed, waste management was done at the lower level. Additionally, with the 37% who agreed and 21% who strongly agreed that there were trained and well-functioning Boma health committees, it is a manifestation that delegation is being implemented at the County, but not to the satisfaction of some community members.

Fiscal decentralization

Revenue collection

The 39% (majority) of respondents who strongly agreed and 32% who agreed with the statement that the County authorities collect taxes from every business in shows that revenue collection has been decentralized. Similarly, the 40% of respondents who strongly agreed that the revenue (taxes) raised by the County is used to improve service delivery to the County communities reveals that some services/development projects in the County are implemented with revenue. This leads to the conclusion that revenue collection has been decentralized.

Revenue expenditure

Thirty-two (the highest number of respondents) who have agreed that the county health budget is sufficient to satisfy health demand indicate that the revenue collected has been mandated to County authorities to adequately improve service delivery, including public health services. However, corruption has highly affected service delivery, as agreed by the majority of the respondents (32%). This can be supplemented by the fact that the majority of the people who responded have expressed dissatisfaction with the misuse of funds provided to improve the quality of services provided by the County, as a high number of respondents strongly agreed (31%) and 29% agreed. As a result, County projects/activities are mostly funded by donors/partners (50% strongly agreed and 23% agreed).

Political decentralization

Decision-making

The studies revealed that, the interference of the central government at the local level is very high, which affects service delivery (21% strongly agreed and 30% agreed), and 32% have also strongly agreed that the voices of citizens should be the basis for decision-making at the local level – meaning that the decision-making process of, probably, key issues have either been politicized or not decentralized to the lower levels.

Accountability

In the findings, 28% of the respondents have strongly agreed and 43% agreed that communities have to select their leaders at the local levels to build trust and to promote participatory community development; 16% were neutral. Nonetheless, 8% disagreed and 5% strongly disagreed. This manifests that leaders at the Bomas/Payams were not elected by the people, but appointed by higher authorities.

Furthermore, the assertion by the majority of respondents (36% strongly agreed and 32% agreed that local citizens have the right to hold local decision-makers accountable for their decisions/actions) is a revelation that there is no accountability to the people. This can be complemented by the fact that in the County, it is not easy for community members to raise critical issues with the relevant authorities (33% agreed, 16% strongly).

Public health service delivery

Availability

The majority of respondents who confirmed (39% agreed and 21% agreed) that there was better treatment at these public health centers or units is an indication that public health services are available at the County, though 14% disagreed and 7% strongly disagreed. This can be supported by the 40% of respondents who agreed that the necessary drugs and health equipment are readily available and in good working conditions.

Accessibility

Most respondents (43% agreed and 29% strongly agreed) that the public health centers or units are easily accessible by community members in the County. However, the credibility of this finding has been contradicted by the fact that the majority of respondents seek health services from private clinics (17% strongly agreed, 35% agreed). This leads to the conclusion that, even if these facilities were accessible, services are not adequately administered.

Quality

The study found that the majority of respondents (41%) were comfortable with the free treatment provided by the public health centers/units, as 47% also confirmed that the health service providers were constantly ready to supply any type of available health service to the people who need it. However, 25% disagreed and 14% strongly disagreed that the health workers do not take bribes from them to get treatment. This means that the respondents felt okay with the free treatment, though of low quality, and some public health workers are corrupt with the supposedly free health services.

Conclusion

Findings indicate that decentralization exists in the county, but with some structural and system gaps affecting public health services delivery. Essentially, de-concentration and delegation are core in administrative decentralization, independence in revenue collection and expenditure strengthens and empowers fiscal decentralization, and devolution of decision-making powers and accountability are fundamental in political decentralization. Therefore, strengthening and improving some attributes of the aforementioned factors can significantly and effectively improve public health services delivery in Juba County, which is still heavily funded by donors, and the majority of the citizens seek health services from private facilities.

Limitations of the study

Limited well-staffed and equipped research service providers that can support the conduct of research, and therefore, cause inefficiency. High cost of conducting research due to high inflation. Citizens were often afraid and avoided being interviewed and therefore, which caused a delay. Long government bureaucracy.

Recommendations

- Capacity development of the lower tiers of local government closer to the communities, such as clean water user committees, health committees, among others.
- Improve the fiscal discipline of the local government units.
- Improve inter-governmental linkages to reduce overlaps, interference s and to foster accountability.

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List of acronyms

Boma: Smallest Administrative Unit
KIIs: Key Informant Interviews
NGOs: Non-Governmental Organizations
Payam: Sub-District /County
PHCC: Primary Health Care Center
PHCU: Primary Health Care Unit

Source of funding

The study was not funded.

Conflict of interest

There is no conflict of interest.

Availability of data

Data used in this study are available upon request from the corresponding author.

Author's contribution

KRSK designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and RM & SK supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

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