Evaluating Quality of Services in Community Differentiated Service Delivery Model. A case of Kakamega county

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DOI*:* https://dx.doi.org/10.4314/ajhs.v36i6.10

Abstract

BACKGROUND

The provision of high-quality services is a prerequisite for the successful implementation of community-differentiated service delivery. The service quality influences the clients' satisfaction, perceived value trust in the model and eventual utilization. Evaluating the quality of services in community differentiated service delivery will inform policymakers of existing quality gaps and in turn, this will assist in formulating strategies that will improve service quality and increase utilization.

METHODOLOGY

This was a cross-sectional study conducted in Kakamega County between September and December 2021 involving 402 participants. using purposive sampling, clients already established on ART were selected and data was collected through a structured questionnaire. Descriptive and inferential statistics were used to analyze data using SPSS version 25.

RESULTS

The results on dimensions of service quality established a high mean score (4.27) related to client literacy and a low score (2.64) on the package of services. There was a moderate positive relationship between client literacy and package of services (0.641) and a strong positive relationship between package of services and competence of the service provider (0.894). On the package of services (79.9%) of participants reported that ART refill and referral services were available, (12.7%) adherence and psychosocial support, 11.7% and 5% viral load sample collection. Regarding quality, the Freidman test ranged from client literacy (7.84), cost of services (7.79), accessibility (5.71), competence of the provider (4/06) and comprehensive package (2.54).

CONCLUSION

The study established a service quality gap in the package of services and the competence of the provider. The package of service provided is not comprehensive enough to address the needs of the clients.

RECOMMENDATION

Policymakers and leaders should re-distribute resources to allow for the training of providers using the differentiated service delivery manual 2023. The dimensions of quality can be reorganized to prioritize the appropriate package of services followed by the competence of lay health providers and lastly client literacy.

Keywords: *Community-Differentiated Service Delivery, Service Quality, Client Literacy, Provider Competence, Public Health*

[***Afr. J.*** *Health Sci*. 2023 36 (6): 713-722]

Introduction

The quality of health services provided may facilitate or hinder the utilization of community differentiated service delivery (CDSD) [1]. The main standard of CDSD is improving health systems efficiency and

providing patient-centred care both of which constitute vital dimensions of quality [2]. Service quality (SQ) and availability affect the ease of access and are related to favourable health outcomes [3] [4]. Access to health services is measured by the ability of an individual to have timely use of health services to achieve the best health outcomes.

In the recent past, health service delivery has undergone much change by decentralizing health service delivery to respond to the growing needs of people living with HIV. For PLHIV accessing health services can be demanding due to its chronic nature and this correlates with increased health care utilization [5] [6]. CDSD responds to increased health service utilization by prioritizing client's needs while at the same time putting into consideration the health system's characteristics [7] [8]. At the community level service provision relies heavily on peer educators also known as lay health workers who are not formally trained. The involvement of peer educators in the operations of CDSD warrants a service quality assessment to ensure that quality is not compromised.

The roles of lay health workers in community differentiated service delivery include refill of antiretroviral therapy, providing adherence counselling, symptoms screening, referral and health education [9] [10]. Clients enrolled in CDSD only visit the facility twice a year after six months for clinic visits and viral load sample collection [11]. Since the contact between the clients and the professional healthcare workers is limited, it becomes appropriate to guarantee that the quality of services provided is standard to curb compromising patient outcomes.

Healthcare services stand out because they carry higher risks due to their impact on health, and patients often rely on healthcare professionals for guidance because they may not fully understand medical matters [12] [13]. Delivery of health services with high quality is crucial, as it improves the chances of reaching desired health outcomes when the services are accessible, acceptable, effective, appropriate, and equitable [14] [15]. Improved outcomes mean a healthy population that is better disposed to achieve economic development.

Quality in CDSD is an important component of service delivery that contributes to PLHIV pursuing, utilizing and being retained in care [16]. The quality of CDSD is multidimensional and can be assessed based on two perspectives the technical and functional dimensions [10]. The technical dimension looks at the quality of health services based on the health care professionals while the functional is based on recipients of services [14] [17]. If clients perceive that services are of high quality they are likely to utilize the services and even refer others [18]. For CDSD perceptions and expectations depend on the literacy of the clients, package of services and their interaction with the provider [19]. Client literacy is the knowledge that clients accessing care at a given facility have about CDSD, its operations and its benefits. It also includes knowing the package of services and where they can get the services [7] [20]. A comprehensive package of services is a package that meets the health needs of the clients by providing information, counselling, ART refill, symptom screening, viral load sample collection and adherence counselling. Provider's competency is whereby the lay health providers are competent and provide effective patient-centered care to PLHIV [21].

To maintain and improve the quality of health services it is important to utilize the expectations and perceptions of patients to identify health system weaknesses. Expectation refers to the wants of the patient as far as services are concerned while perception is the client's evaluation of the services' real experience with health service delivery [22]. There is a paucity of data on the assessment of the quality of services provided in the CDSD model among PLHIV.

Little attention has been paid to the quality of services provided in the CDSD model yet there is low uptake. The main goal of this study is to evaluate the quality of services offered in CDSD based on subthemes of client literacy, package of services and competence of the provider.

Methodology

Study design

This was a descriptive cross-sectional study conducted between September 2021 and December 2021. The study was carried out in high-volume facilities in Kakamega county involving 402 study participants.

Sample size

A sample size of 402 adults living with HIV accessing treatment in a high-volume facility was enrolled. The inclusion criteria were clients well established on treatment who had been on antiretroviral therapy for more than one year and had undetectable viral load.

Sampling technique

Purposive sampling was used to identify clients on ART accessing services from the chosen facility. This technique was used since the researcher was interested in clients already established on treatment. Purposive sampling was used to identify adult clients already on ART, with undetectable viral load, accessing treatment from the facility and not a pregnant and breastfeeding mother.

Methods and instruments of data collection

A structured questionnaire was developed based on the functional dimension of quality with 20 questions. The questionnaire was pretested on 10 clients from a different facility that was not among those of assessment.

Ethical consideration

This study was done after obtaining ethical approval from the National Council of Science and Technology (Nascosti/P/21/12623), the university ethical review team (KEMU serch/HSM/35/2021) and the county director of health Kakamega County. Informed consent was obtained from participants after explaining the objectives of the study. The right to withdraw from the study whenever they wanted to was respected. An anonymous interview guide was used to protect the identity and confidentiality of the information obtained from the individual participants

Results

Most of the participants were females with up to primary level education who had been on treatment for 4-6 years and belonged to the category of clients. (Table 1).

Table 1:
Relationship between demographic characteristics and quality of differentiated service delivery

		% (n)	Mean (SD)	p-value	T
Gender	Male	48.9 (180)	3.81 (0.42)	0.003	2.99
	Female	51.1 (221)	3.66 (0.56)		
Education level	Up to Primary	229	3.69 (0.51)	0.001	11.9
	Secondary	162	3.82 (0.48)		
	College	10	3.04 (0.71)		
Duration on treatment in years	1-3	13	3.64 (0.19)	0.14	1.71
	4-6	290	3.70 (0.54)		
	7-9	88	3.78(0.52)		
	>10	10	4.04 (0.15)		
Client type	Client	250	3.69 (0.50)	0.22	1.46
	Peer educators	86	3.77 (0.50)		
	Mentor mothers	3	4.14 (0.01)		
	Support group leaders	63	3.80 (0.56)		

The comparison of mean score indicates that male participants had the highest mean score, those with secondary level education, had been on treatment for 7-9 years and were support group leaders.

Table 2 indicates that the F-test ranged in the dimension of quality from the highest to the lowest client literacy (7.84), cost of services (7.79), accessibility (5.71), competence (4.06) and comprehensive package (2.54). Table 3 illustrates that there is a moderate positive relationship between client literacy and the package of services (0.641) and a strong positive relationship between the package of services and the competence of the service provider (0.894). client literacy increases the chances of utilizing the package of services in CDSD thereby increasing the competence. The P-value of .000 indicates a significant relationship between client literacy, the package of services and the competence of the provider. Table 4 indicated that (79.9%) of participants agreed that ART refill and referral services were available, (12.7%) adherence and psychosocial support, 11.7% and 5% viral load sample collection.

Table 2:
Mean and standard deviation of dimensions of service quality of differentiated service delivery

Dimension of quality	Mean (SD)	minimum	Maximum	F test
Client literacy	4.17 (0.60)	2.55	5	7.84
The cost of services is affordable	4.15 (0.84)	1	5	7.79
Accessibility	3.74 (0.83)	1.43	5	5.71
Competence of the Provider	3.23 (0.82)	1	5	4.06
The comprehensive package of services	2.64 (1)	1	1	2.54

Table 3:
Correlation for client literacy, package of services, competence and quality of services

	Client literacy	Package of services	Competence of service provider
Client Literacy	1		
Package of services	.641**	1	
Competence of the provider	.654**	.894**	1

Table 4:
Comprehensiveness of package of services in community differentiated service delivery

Variable	Agree % (n)	Disagree % (n)	Chi-square	p-value
Symptom Screening is done in the community-differentiated service delivery model	11.7%(47)	87.8%(354)	235.035	0.01
ART refill is done in the community differentiated service delivery model	79.9%(322)	19.6%(79)	147.254	0.01
Psychosocial and Adherence support is provided in the community-differentiated service delivery model	12.7%(51)	86.8%(350)	222.945	0.01
Referral is done for clients who cannot be managed in community community-differentiated service delivery model	79.9%(322)	19.6%(79)	147.254	0.01
Viral Load sample Collection is done in the community-differentiated service delivery model	5%(21)	95% (380)	222.945	0.01

N=401; t-test for equality of means: test value =0 (H_0: there is no difference expected between the means, at ά=0.05, 2-tailed); reject H0 if p-value ≤ ά, otherwise fail to reject H_0 If p> ά

Table 5 indicates a strong correlation between service quality (r=0.899) and competence of the provider followed by comprehensiveness of the package of services, client literacy, cost of services and then lastly accessibility.

Discussion

This study evaluated the quality of care in a community-differentiated service delivery model specifically the functional dimension of quality looking at client literacy, the appropriate package of service and the competence of the provider from the client's perspective.

On dimensions of quality, Freidman's test ranked service quality as follows; client literacy, cost of services, accessibility, competence of the provider and comprehensive package of services. The client literacy which had a high correlation with the quality of differentiated service delivery was first. This suggests that PLHIV are aware of CDSD and could have been sensitized on the model through health education during their normal clinic days at the waiting area. These findings are similar to [22], who established the client ranked the quality of services based on information received. Quality of services in CDSD cannot be achieved without empowering PLHIV about the model and its benefits. Client literacy increases the assertiveness of PLHIV utilizing a community-differentiated service delivery model.

The cost of services was ranked second and related to the findings by [23] who established that clients were comfortable because the community-differentiated services were delivered at no cost. The authors suggest that participants perceived that the cost of differentiated service delivery was affordable. Referring to [24], the clients reported that they did not incur any cost of services or use transport to travel to the facility. Therefore, clients were satisfied with this dimension of service quality.

The accessibility of services by the clients came third with the majority of clients agreeing that the community-differentiated service delivery was accessible. The percentage of clients who disagreed that services were not accessible could be attributed to clients who due to self-stigma, choose to access services from far away to conceal their identities for fear of being recognised. These findings are in line with [25] [26]and [27] who found that most clients who were struggling with stigma could travel long distances to access services where they were not known.

Most of the study participants disagreed on the package of services, they were dissatisfied with the services offered at CDSD. The package of services was not comprehensive which revealed a service gap. The Differentiated Service Delivery Operational Manual 2023 has outlined core services to be offered in CARGs. These services include ART refill, screening for opportunistic infections using five cardinal signs, adherence counselling, referral and psychosocial support [28] [29]. In this study, most participants agreed on ART refill and referral.

Table 5:
Correlation between service quality in community differentiated service delivery and its dimension

	1	2	3	4	4	5	6
1	Client literacy	1					
2	Cost of services	.434**	1				
3	Competence of the provider	.435**	.280**	1			
4	Accessibility	.005	.000	.604	1		
5	The comprehensiveness of the package of services	.349**	.399**	.565**	.579**	1	
6	Quality of services	.654**	.899**	.641**	.274**	.894**	1

Method: Pearson correlation; **. Correlation is significant at the 0.01 level (2-tailed); Significance for all was .000 less than the p-value or 0.01and 0.05; N=401

There was a significant relationship between the competence of the provider and the package of services, since peer educators offered service yet lacked formal training. Training the peer educators would enable them to offer a comprehensive package of services.

These findings are similar to [30] [18] [31]and [8], with most clients having indicated that they did not receive all services, particularly opportunistic infection screening, in the CDSD model, leading them to prefer receiving care at the facility where a clinician was available. A related study by [32] [33, 7]identified poor quality of services offered was related to inappropriate services, they established that the package of services was inappropriate as it lacked referral and linkage services and patient-centred communication [34] [35].

There was a significant and negative correlation between all the variables and quality of services meaning client literacy, cost of services, competence package of services and accessibility led to a negative perception of the quality of services. The same relationship was established by [36] [21] [37] [38] that clients who had more information about health services perceived the services to be of high quality. Quality community differentiated service delivery cannot be provided without a clear understanding of the community differentiated services delivery model [6] [39] [40] [18]. This needs to start with the training of the lay health providers on how to form a community-differentiated service delivery.

Strength and Limitation

This is the first study to evaluate the quality of community-differentiated service delivery. The results of this study will go a long way in informing policymakers of the quality of services in community differentiated service delivery and act as a guideline for continuous quality improvement.

While this study focused on the quality of services in community differentiated services it failed to focus on all dimensions of service quality. Evaluating all dimensions of service quality will provide added information on which to base the policies.

This study evaluated the package of services within HIV care treatment and support but failed to look at services within HIV prevention.

Conclusion

The findings in this study indicate that the greatest service gap was the lack of a comprehensive package of services. This dimension indicates that essential services recommended in the differentiated service delivery operational manual 2023 were lacking in community differentiated service delivery. Lack of a comprehensive package means poor quality of services. This failure in service quality could be the reason for the low uptake of the community-differentiated service delivery among PLHIV.

The negative service quality gap in dimensions of community differentiated service delivery can be used by policymakers as a guide to planning and redistribution of resources. The five dimensions can be reclassified into three priority groups for resource reallocation and managerial attempts to reduce quality gaps so that a comprehensive package will be the first followed by the competence of the provider and client literacy.

The findings of the study provide important guidance for policymakers in planning and allocating resources for the review of the package of services. Policymakers should prioritize the allocation of resources towards training lay health providers to offer a comprehensive package of services, increasing technical assistance visits at the community level, and implementing treatment literacy sessions to enhance client confidence in utilizing community models. Future studies should investigate underlying factors affecting the competency of

health workers in providing community-differentiated service delivery.

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Acknowledgements. The authors wish to acknowledge the national Aids and STI control program for support during the process, the county government of Kakamega for allowing us to conduct the study, health facility staff and participants for their contribution.

Authors' contributions. The corresponding author conceived the idea and methodology, analyzed the data, drafted the manuscript and contributed to its subsequent revisions. Other authors contributed to the methodology, analyzed the data and contributed to the drafting and revision of the manuscript for intellectual content. All others read and approved the manuscript before submission.

Source of funding. This research was funded from contributions by the authors. No external funding was received.

Data availability. All data on which the results and discussions for this paper are based is available from the corresponding author upon reasonable request.

Conflict of interest. The authors declare no competing interest, financial or otherwise

References

1. **Abelman R, Alons C, Stockman J, Teri I, Grimsrud A, Ombija M, *et al*.**Implementation of differentiated service delivery for paediatric HIV care and treatment: opportunities, challenges and experience from seven sub-Saharan African countries. *Fam Med Community Health*, 2020;8(3): 230-247. Available from: doi: 10.1136/fmch-2020-000393
2. **Fisseha G, Berhane Y, Worku A, Terefe W**, Quality of the delivery services in health facilities in northern Ethiopia, *BMC Health services*, 2017;17(1):187. available from:doi: 10.1186/s12913-017-2125-3.
3. **Sharifi T, Hosseini SE, Mohammadpour S, Javan-Noughabi J, Ebrahimpour H, Hooshmand E,** Quality assessment of services provided by health centres in Mashhad, Iran: SERVQUAL versus HEALTHQUAL scales". *BMC Health Serv Res* 2021; **21**(4):397-401.Available from:doi.org/10.1186/s12913-021-06405-4.
4. **Wellay T, Gebreslassie M, Mesele M, Gebretinsae H, Ayele B, Tewelde A, Zewedie Y,** Demand for health care service and associated factors among patients in the community of Tsegedie District, Northern Ethiopia. *BMC Health Services,* 2018;18(697): 1-10. Available from: doi.org/10.1186/s12913-018-3490-2
5. **Bango F, Ashmore J, Wilkinson L, van Cutsem G, Cleary S**. Adherence clubs for long-term provision of antiretroviral therapy: cost-effectiveness and access analysis from Khayelitsha, South Africa. *Tropical Medicine and International Health*, 2016;21(9):1115–23.Available from: doi: 10.1111/tmi.12736, 2016.
6. **Kelly JD, Frankfurter R, Lurton G, Conteh S, Empson SF, Daboh F, *et al.*** Evaluation of a community-based ART programme after tapering home visits in rural Sierra Leone: a 24-month retrospective study. *Journal of Social Aspects of HIV/AIDS*. 2018;*15*(1):138–145. Available from:doi.org/10.1080/17290376.2018.1527244
7. A**mstutz A, Lejone TI, Khesa L, Kopo M, Kao M, Muhairwe J, *et al.*** Offering ART refill through community health workers versus clinic-based follow-up after home-based same-day ART initiation in rural Lesotho: The VIBRA cluster-randomized clinical trial.*PLOS MED*.2021;18(10):12-19.Available from: doi: 10.1371/journal.pmed.1003839, 2021.

8. **Fox MP, Pascoe S, Huber AN, Murphy J, Phokojoe M, Gorgens M**. Adherence clubs and decentralized medication delivery to support patient retention and sustained viral suppression in care: Results from a cluster-randomized evaluation of differentiated ART delivery models in South Africa. *PLoS Medicine*.2019;16(7):1–21. Available from:doi: 10.1371/journal.pmed.1002874, 2019.
9. **World Health Organization,** Consolidated guidelines on person-centred HIV patient monitoring and case surveillance, Geneva: *World Health Organizatio*n., 2017.
10. **Karasan A, Erdogan M, Cinar M,** Healthcare service quality evaluation: An integrated decision-making methodology and a case study, *Socio-economic planning sciences*. 2022;82(3):360-369. Available from:doi.org/10.1016/j.seps.2022.101234,2022.
11. **Ministry of Health; National AIDs and STI control program.** Differentiated service delivery operational Mannual, NAIROBI: *National AIDs and STI Control Program*, 2023.
12. **Izadi A, Jahani Y, Rafiei S, Masoud A, Vali L**. Evaluating health service quality using performance analysis. *journal of Health care quality*.2017; 30(7):656-663. Available from:doi.org/10.1108/IJHCQA-02-2017-0030
13. **Seni YO, Erhun WO.**Assessing community pharmacists' involvement and clients' opinion on HIV/AIDS services in community pharmacies in Nigeria: a cross-sectional survey.*International Journal of STDs AIDS*.2021; 32(6):538-550.Available from: doi: 10.1177/0956462420981527.
14. **Alemayehu M, Yakob B, and Khuzwayo N.** Quality of emergency obstetric and newborn care services in Wolaita Zone, Southern Ethiopia. *BMC Pregnancy and childbirth*.2022; 22(1):686-691. Available from:doi: 10.1186/s12884-022-05019-w.
15. **Kruk ME, Gage AD, Arsenault C, Jordan K, Leslie HH, Roder-DeWan S.** High-quality health systems in the sustainable development goals era: time for a revolution.*The Lancet Global Health*.2018;6(11):1196–1212. Available from:doi: 10.1016/S2214-109X(18)30386-3.
16. **Okere NE, Censi V, Machibya C, Costigan K, Katambi P, Martelli G, *et al.***Beyond viral suppression: Quality of life among stable ART clients in a differentiated service delivery intervention in Tanzania. *Quality Life Research.*2022;31(1):159-170.Available from:doi: 10.1007/s11136-021-02889, 2022.
17. **Estiri M, Dahooie JH, Zavadiskas EK**. Providing a Framework for Evaluating the Quality of Health Care Services Using the Health Quality Model and Multi-Attribute Decision-Making Under Imperfect Knowledge of Data. *Informatics*. 2023; 34(1):85-120.Available from: Doi:10.15388/23-INFOR512,2023.
18. **Dudhia R, Kagee A.** Experiences of participating in an antiretroviral treatment adherence club. *psychology club*. 2015;20(4):488–94.Available from: doi: 10.1080/13548506.2014.953962.
19. **Geldsetzer P, Francis JM, Sando D, Asmus G, Lema IA, Mboggo E**.Community delivery of antiretroviral drugs: A non-inferiority cluster-randomized pragmatic trial in Dar es Salaam, Tanzania.*PLOS ONE*. 2018;15(9):1-10.Available from: doi: 10.1093/heapol/czaa088
20. **Musukwa M.** Evaluating the quality of differentiated service delivery: Challenges and lessons learned.Columbia.ICAP, 2022
21. J**obarteh K, Shiraishi RW, Malimane I, SamoGudo P, Decroo T, Auld AF, *et al.***Community ART support groups in Mozambique: The potential of patients as partner in care. Global HIV/AIDs. *Global HIV/AID*S 2017; 11(12) 123-132.Available from: doi:10.1371/journal.pone.0166444.
22. **Ministry of Health, Kenya;** National STI and AIDs Control Program.Evaluation of the quality improvement support to differentiated care models for antiretroviral therapy in Kenya NAIROBI: *National AIDs and STI Control Program*, 2023.
23. **Mudavanhu M, West NS, Schwartz SR, Mutunga L, Keyser V, Bassett J, *et al.*** Perceptions of Community and Clinic-Based Adherence Clubs for Patients Stable on Antiretroviral Treatment: A Mixed Methods Study. *AIDs behaviour*.2019; 45(8):1-11. Available from: doi: 10.1007/s10461-019-02681-8.
24. **AdjeteyV, Obiri-Yeboah D, Dornoo B.** Differentiated service delivery: a qualitative study of people living with HIV and accessing care in a tertiary facility in Ghana.*BMC Health Service Research*.2019;19(95):230-240.

available from:doi:10.1186/s12913-019-3878-7.

25. **Pasipamire L, Nesbitt RC, Ndlovu S, Sibanda G, Mamba S, Lukhele N,** Retention on ART and predictors of disengagement from care in several alternative community-centred ART refill models in rural Swaziland.*AIDs International Journal*,2018:21(9): 251-265: Available from doi: 10.1002/jia2.25183, 2018.
26. **Sharer M, Davis N, Makina N, Duffy M, Eagan S.** Differentiated Antiretroviral Therapy Delivery: Implementation Barriers and Enablers in South Africa.*JANAC* .2019;30(5):511–20.Available from:doi: 10.1097/JNC.00000000.
27. **Vandendyck M, Motsamai M, Mubanga M, Makhakha S, Tungaal S, Jonckheree S, *et al.***Community-based ART resulted in Excellent and can leverage community empowerment in rural Lesotho, a mixed study method.*HIV/AIDs Research and Treatment*. 2015;2(2) 44-50. Available from: **doi.org/10.17140/HARTOJ-2-107, 2015.**
28. **Ministry of Health, National AIDs and STI Control Program,** Differentiated Care: Operational Guide. Nairobi, Kenya: January 2017, Nairobi: NASCOP, 2017.
29. **Makumbang F, Ndlovu S, Wykvan B**. Comparing Patients' Experiences in Three differentiated service delivery model. *Journal Sage*.2021; 32(2) 238-254. Available from: doi:10.1177/104973232110571.
30. **Rasschaert F, Telfer B, Lessitala F, Decroo T, Remartinez D, Biot M,** " A qualitative assessment of a community antiretroviral therapy group model in Tete, Mozambique. PloS one. 2014;9(3):e91544. doi: 10.1371/journal.pone.0091544," *PLOS medicine* , p. 9(3):e91544. doi: 10.1371/journal.pone.0091544, 2018.
31. **Naslund JA, Odom JD, Destine CJ, Jogerst KM, Senecharles RR, Louise MJ, *et al.*** Adapting and implementing a community program to improve retention into care among people with HIV in southern Haiti: "Group of 6'.*AIDs Research and Treatment.* 2018;13(6)1-9.Available from: doi:10.1155/2014137545., 2014.
32. **Holmes CB, Sanne I.**Changing models of care to improve progression through the HIV treatment cascade in different populations.*Journal of HIV and AIDS* 2015;10(6):440-450.Available from:doi:10.1097/COH.0000000000000194.
33. **Rasaq Kayode O, Afeez A, Babatunde O.** Differentiated service delivery and the community Pharmacists' roles in achieving UNAIDS 2030 target in Nigeria.*Saudi Phamarcenticals Journal.* 2021; 29(8):815-819. Available from:doi: 10.1016/j.jsps.2021.06.003.
34. **Grimsrud A, Bygrave H, Wilkinson, L**.The Case For Family-Centered Differentiated Service Delivery for HIV," *JAIDS Journal of Acquired Immune Deficiency Syndromes*. 2021;78(34):124-127. Avialble from:DOI: 10.1097/QAI.0000000000001733.
35. **Grimsrud A, Wilkinson L.**Acceration of HIV treatment during COVID era. *Journal of international AIDs society*.2022;26(4) Available from: doi.org/10.1002/jia2.25704
36. **Hanrahan CF, Schwartz SR, Mudavanhu M, West NS, Mutunga L, Keyser V.** The impact of community-versus clinic-based adherence clubs on loss from care and viral suppression for antiretroviral therapy patients: Findings from a pragmatic randomized controlled trial in South Africa. *PLoS Medicine*. 2019;16(5):1–15. Available from: doi: 10.1371/journal.pmed.1002808.
37. **Kopo M, Lejone TI, Tschumi N, Glass TR, Kao M, Brown JA, *et al.***Effectiveness of a peer educator-coordinated preference-based differentiated service delivery model on viral suppression among young people living with HIV in Lesotho: The PEBRA cluster-randomized trial. *PLOS MED*.2023; 3;20(1): 1021-1032. Available from: doi: 10.1371/journal.pmed.1004150.
38. **Kuo AP, Roche SD, Mugambi ML, Pintye J, Baeten JM, Bukusi E, *et al.***The effectiveness, feasibility and acceptability of HIV service delivery at private pharmacies in sub-Saharan Africa: a scoping review.*Journal of international AIDs Socity*.2022; 25(10):260-272.Available from: doi: 10.1002/jia2.26027.
39. **Sita L, Sorawit A, Pich S, Jitsupa P, Pravit M, Tanat C, *et al.***Client and provider preferences for HIV care: Implications for implementing differentiated service delivery in Thailand. *International Journal of AIDs Society*.2021; 24(4): 126-137.Available from:doi.org/10.1002/jia2.25693.
40. **Roy M, Moore CB, Sikazwe I, Holmes C**. A Review of Differentiated Service Delivery for

HIV Treatment: Effectiveness, Mechanisms, Targeting and scale. *HIV and AIDS Journal.* 2019;16(2)324–334. Available from:doi.org/10.1007/s11904-019-00454-5, 2019.

41. **Meaghen Q, Davidson Kathryn, JR, Delan D, Susan MS, Cortez R, Ligia K.** Evaluating the quality of adolescent community mental health services. *British Medical Journal*. 2019;11(5):124-132. Available from:doi: 10.1136/bmjopen-2020-044929.
42. **Mohamed A, Mogghadam A, Zarei E, Bagherzaden R, Daghai H, Farrokhi E.** Evaluation of quality from the client's viewpoint. *BMC Health Services Research*. 2019;19(11):170-178. Available from: https//doi.org/10.1186/s12913-019-3998-0.
43. **Rasschaert F, DecrooT, Remartinez D, Telfer B, Lassitala F, Biot M, *et al*.**Adapting a community-based ART delivery model to the patient's needs A mixed methods Research in Tete, Mozambique. *BMC Public Health.*2018;14 (364), 1-11. Available from:https:/www.biomedcentral.com/1471-2458/14/364.
44. **Okere,N.E., Meta, J.Okere NE, Meta J, Maokola W, Martelli G, *et al*.**Quality of care in a differentiated HIV service delivery intervention in Tanzania: A mixed-methods study," *PLOS ONE*.2022;17(3):15-23.Available from: doi: 10.1371/journal.pone.0265307. PMID: 35290989.
45. **Vandendyck M, Motsamai M, Mubanga M, Makhakhe S, Tunggal S-N, Jonckheree S.** Community-Based ART Resulted in Excellent Retention and Can Leverage Community Empowerment in Rural Lesotho, A Mixed Method Study. *HIV AIDs Research.*2015; 2(2):44-50. Available from:doi.org/10.17140/HARTOJ-2-107
46. **World Health Organization (WHO).** Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. 2016, Geneva: *World Health Organization,* 2021.
47. **Vogt F, Kalenga L, Lukela J, Salumu F, Diallo I, Nico E *et al*.**Decentralizing ART Supply for Stable HIV Patients to Community-Based Distribution Centers: Program Outcomes From an Urban Context in Kinshasa, DRC.2017;74(3):326-331.Available from:doi.org/10.1097%2FQAI.0000000000001215
48. **de Jager GA, Crowley T, Esterhuizen TM**. Patient satisfaction and treatment adherence of stable human immunodeficiency virus-positive patients in antiretroviral adherence clubs and clinics.*Primary Health care.*2019;10(1): 1230-1243. Available from:doi: 10.4102/phcfm.v10i1.1759.