

Gender gaps in agro-based income generating enterprises among rural households in Ogun state, Nigeria

Kayode, A.O.^{1*}, S.A. Adebayo¹, M.F. Salami² and S.T. Odeleye¹

¹ Department of Agricultural Extension and Rural Development, University of Ilorin, PMB 1515 Ilorin, Nigeria.

² Department of Agricultural Economics and Farm management, University of Ilorin, PMB 1515 Ilorin, Nigeria.

Abstract

Men and women both make substantial contributions in agro-based income generating enterprises to augment their household income. This study analysed participation rate in on-farm and off-farm activities on a gender basis in Ogun state, Nigeria. Specifically, the study described the socio-economic characteristics of the respondents, ascertained the level of participation of male and females in agro-based income-generating enterprises; examined factors influencing participation in agro-based income-generating enterprises and identified the constraints to participation in agro-based income generating enterprises between the genders. A three-stage random sampling procedure was used to select 132 respondents (87 males, 45 females) Data were collected and analyzed using descriptive statistics and inferential statistics (Regression and T-test) Results showed farm size of the male was 2.7 hectares with a mean monthly income of N40,000 while the females had 1.6 hectares and N49,4000. Males and females recorded high-levels of participation in agro-based activities with a high mean score of 2.67 and 2.68 respectively. Lack of education and training was a major constraint among male respondents (MS=4.38) while discrimination based on gender, (MS=4.04) constrained the females. The result revealed that years of education ($t = 0.822, P < 0.05$) and years of experience in the agro-based enterprise ($t = -0.027, P < 0.05$) had positively significant the study concluded by determining the level of participation and factors that influence participation in based agro-based income generating activities lds. It is thus recommended that policies fostering participation in agro-based enterprises with improved access to land and resources, regardless of gender, be inclusive.

Keywords: Off-farm; on-farm; male; female.

1. Introduction

Agriculture has been considered as Nigeria's most important sub-sector of the economy, second only to petroleum. Despite being a key source of income for rural households, agriculture alone cannot meet the needs of the people, particularly in developing countries. As a result, rural households have become more occupationally flexible, spatially mobile, and reliant on non-agricultural income-generating activities to supplement their income. It is worth emphasizing

that rural households rely on other forms of income generation, such as entrepreneurship and venture formation, in addition to agriculture. The combination of these complex and diversified activities is the result of rural households participating in entrepreneurial activities to augment income from farming, thereby diversifying their source of income and minimizing agricultural shocks.

Moreover, most of the entrepreneurial activities in rural areas are based on agricultural and natural resource products, farm families can broaden their income opportunities by diversifying into higher-value on-farm and off-farm enterprises (FAO, 2018). On-farm enterprises are related to

*Corresponding author: A.O. Kayode

Email: kayode.ao@unilorin.edu.ng

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the production of crops and livestock that occur on the farm while off-farm enterprises are related to agricultural activities that occur outside of the field such as processing, packaging, and value addition (Benjamin, 2023). For a very long time, the perception of farm households in developing countries is that they rely almost exclusively on on-farm activities and undertake little or no activities off-farm. This perception has led policymakers to concentrate on the farm sector at the expense of the off-farm sector (Babatunde, 2013). However, there has been increasing evidence showing that small-holder farm households in developing countries rarely rely on agriculture alone, but often maintain a portfolio of income activities in which off-farm activities are an important component. Haggblade *et al.* (2010) indicate that off-farm income accounts for between 35% and 50% of the total income of rural households in developing countries.

Gender has proven to be an essential variable for analyzing the roles, responsibilities, constraints, opportunities, incentives, costs, and benefits in Agriculture (Koyenikan, 2010). The term gender refers to the economic, social, political, and cultural attributes and opportunities associated with being a man and woman (World Bank, 2009). Gender equality is the absence of discrimination based on a person's sex, opportunities, allocation of resources and benefits, or in access to services such as agricultural advice. It implies that the interests, needs, and priorities of both women and men are taken into consideration, recognizing the diversity among different groups of women and men (Marc and Mamusha, 2011).

In Nigeria, gender participation is prescribed expectations and obligations, responsibilities, and behavior of the masculine and feminine gender (Onuoha, 2019). Male and female participation in agro-based enterprise is widespread in Nigeria. Men play significant roles in agricultural activities such as land preparation, planting, harvesting, post-harvest processing, and marketing of farm produce. Many men also run

small and medium-scale agro-based enterprises, including livestock and crop farming, agribusiness, and trade in agricultural inputs and output Mtsor and Idisi (2014). Studies have shown that both male and female participation in Agro-based enterprises involves women who play vital roles in different aspects of income generation such as farming and off-farming operations and also represent a substantial share of the total agricultural labor force, as individual food producers or as agricultural workers. Food and Agricultural Organization (FAO, 2017) asserted that with the increasing male migration, women are becoming the sole producers of food for the maintenance of the family, this shows that women play a major role in income generating Agro-based enterprises such as subsistence food production, food processing, home crafts market trade, etc.

However, the purpose of this study is to examine the level of male and female participation in agro-based income-generating enterprise. It is worth noting that this study is limited to males and female that choose either to specialize in farming or diversify into off-farm activity as a means of sustaining their livelihood. The outcome of this study would be of immense benefit to policymakers, development planners, and other stakeholders who seek to promote rural development in African communities. The participation of both males and females in agro-based income generating enterprise in Ogun state spans a wide spectrum. Their specific activities, their relative factor productivity, the problems encountered and the benefits derived are poorly appraised and rarely articulated. The awareness of the need for both gender participation is gradually creeping in, as a result of the need for gender-disaggregated data to effectively plan agricultural development programs. It is therefore necessary to assess the level of male and female participation in Agro-based enterprises in Ogun state to identify gaps if any. It is also worth noting that there are many theoretical and empirical studies of different scholars discussing income-

generating activities (Adam, 2018; Dickson, Ekpe, and Egbe, 2014; Mtsor and Idisi, 2014; National Bureau of Statistics, 2013). However, most of them are based on an assessment of women's participation in generating income-generating enterprises and leave behind other groups in the communities like men and youths. Moreover, the impact of agro-based income-generating enterprises is partially addressed by different studies which lead to limited empirical studies that shed light on the impact of agro-based income generating enterprises. It is against this background that the study assessed the level of gender participation in agro-based income generating enterprises among males and female in Ogun state, Nigeria

The specific objectives were to:

1. ascertain the level of participation of males and female in agro-based income-generating enterprises in Ogun state;
2. assess the factors influencing gender participation in agro-based income-generating enterprises in Ogun state;
3. identify the constraints to participation in agro-based income-generating enterprises between the genders.

Hypotheses of the Study

The hypothesis was stated in a null form as follows:

H₀₁: There is no significant relationship between the socioeconomic characteristics of respondents and the level of gender participation in agro-based income generating enterprises.

H₀₂: There is no significant difference between the level of participation of males and female in agro-based income-generating enterprises.

2. Materials and methods

2.1. The Study Area

The study was carried out in Ogun State, which is located in the southwestern region of Nigeria. This state is known for its rich agricultural resources, and agro-based enterprise is a major source of livelihood for many residents (Ajibefun

et al., 2018). Ogun State has a landmass of approximately 16,409 square kilometers with an estimated population of (NBS, 2021). According to the National Population Commission of Nigeria, the estimated population of 7,221,827 people (NPC, 2021). Agriculture is a crucial aspect of the economy of Ogun State, and it has been the subject of several research studies Oyekale *et al.* (2016)

2.2. Sampling Procedure and sample size

The population for the study consists of all males and female who are into agro-based income enterprises in Ogun state, Nigeria. A three-stage random sampling procedure was used for the study. The first stage was the purposive selection of 20% of the LGAs in the state giving a total of 4 Local governments which include: Ota, Abeokuta, Ijebu-Ode, and Shagamu. The justification for the selection was based on the high concentration of male and female engagement in agro-based enterprises in the areas (Ogunsola *et al.*, 2022). In the second stage, with the aid of local leaders and extension agents in the Local Governments, a list of agro-based income generating workers was generated which formed the sample frame. In the third stage, 50% of the respondents were randomly selected from each of the local governments to give a total of 87 males, and 45 females arriving at 132 respondents.

2.3. Data Collection and Analysis

The Instrument for Data Collection was a structured interview schedule. The instrument was used to elicit information on the socio-economic characteristics of the respondents, to generate responses on the various types of agro based income activities, to obtain information on the level of participation of agro based income activities, to examine factors influencing gender participation in agro-based income generating enterprises, and also identified the constraints to gender participation in Agro-based income generating enterprises.

The data collected were analyzed using descriptive statistics such as percentages, mean scores, and frequency distributions. Respondents' socioeconomic characteristics were measured with the use of descriptive statistics. In determining the level of participation in agro-based income generating activities, some activities each for on-farm and off-farm activities that followed Adam (2018) and report from a reconnaissance survey were generated which was rated on a 3-point Likert type scale of No participation=1, Partial-Participation=2 and High Participation=3, The mean score was determined and the mean score was calculated, Mean below the benchmark was considered as low Participation while those above were considered as high participation.

For the factors determining the participation of males and female in participating in Agro-based

income generating enterprises. A list of factors was drawn and it was measured on a 5-point Likert-type scale of Strongly agreed=5, Agree 4, Indifferent=3. Disagree=2 and strongly disagree=1, The mean score was determined and the mean score was calculated benchmark of 3, any factor below 3 is considered a minor factors while factors equal to 3 or above 3 are considered as major factors. while inferential statistics used was the Regression Analysis and Independent Samples T-Test. Respondents were used to testing the relationship between socio economic characteristics of the respondents and the level of participation in agro-based income-generating activities while Independent Samples T-Test was used to test the significant difference between male participation and female participation in agro based income generating activities.

Table 1. Sampling Procedure and Sample Size

Number of LGA in Ogun state	Random selection of 20% of the Local Government Areas	Sample frame		Random selection of 50%	
		Males	Females	Males	Females
20	Ota	56	20	28	10
	Abeokuta	48	24	24	12
	Ijebu-ode	36	28	18	14
	Shagamu	34	18	17	09
TOTAL		174	90	87	45

3. Results and discussion

3.1. Respondents' socio-economic Characteristics

The result in Table 2 indicates that the mean age for males and female was 44.8 years and 42.2 years. Distribution based on sex was slightly skewed towards the male (65.9%), while the female was 34.1%. This indicates the dominance of men in agro-based businesses. This is in agreement with the work of Dakora *et al.* (2019), which revealed that a greater proportion of men were involved in agro-based enterprises. The majority of the male respondents were married (89.7%), with 75.6% of the females also married, the mean household size of the respondents was 5 and 4 persons for male and female households

respectively. This is in line with Akpan *et al.* (2011), which affirms that the majority of agro-based workers are married.

A larger proportion of the male respondents (77.9%) had on-farm enterprises as their major source of agro-based income while 40.0% had off-farm enterprises as their major source of agro-based income. However, female respondents recorded higher participation (64.5%) in off-farm enterprises and 55.6% in on-farm enterprises. This implies that there is higher engagement of men in on-farm activities than women which may be due to the rigorous activities attributed to on-farm businesses. This concurs with the result of Amaechina *et al.* (2018) which revealed that women participate more in off-farm enterprises than on-farm enterprises. Respondents had an

average of 9.5 and 8.9 years for male and female respondents respectively. This implies that men have more experience in agro-based enterprises than women. On-farm size, the result in Table 2 showed that the mean farm size for males and female were 2.7 and 1.6 hectares respectively.

This corroborates the findings of Onya *et al.* (2020) that women have less access to arable land than men in Nigeria. The average monthly income earned from agro-based enterprises in the study area was N111,124.1 and N107,353.3 for men and women respectively.

Table 2. Distribution of Respondents by Socio-economic Characteristics in the Study Area (n=132)

	Male (n=87)				Female (n=45)			
	F	%	Mean	SD	F	%	Mean	SD
Sex	87	100.0			45	100.0		
Marital Status								
Single	4	4.6			5	11.1		
Married	78	89.7			34	75.6		
Widowed	2	2.3			2	4.4		
Divorced	3	3.4			4	8.9		
Age								
≤ 25	1	1.1			2	4.4		
26-35	16	18.4	44.8years	8.9	5	11.1	42.2years	9.4
36-45	28	32.2			18	40.0		
46-55	29	33.3			17	37.8		
≥ 56	13	14.9			3	6.7		
Educational Years								
0	10	11.5			2	4.4		
1 – 6	25	28.7	8.4		8	17.8	8.6	
7 – 12	29	33.3			22	48.9		
> 12	23	26.4			13	28.9		
Household Size			5 persons	1.7			4 persons	1.3
≤ 3	31	35.6			12	26.7		
4-6	46	52.9			30	66.7		
≥ 7	10	11.5			3	6.7		
Years of Experience in Agro-based								
≤ 10	56	64.4	9.5years	4.7	28	62.2	8.9years	4.7
11-20	28	32.2			15	33.3		
≥ 21	3	3.4			2	4.4		
Farm Size (in hectares)			2.7 ha	1.6			1.6 ha	1.2
1-3	49	61.3			34	91.9		
≥ 4	31	38.8			3	8.1		
Monthly Income from Agro-based Enterprise (in Naira)			N111,124.1	40,924.0			N107,353.3	49,468.6
≤ 50000	9	10.3			10	22.2		
50001-100000	28	32.2			10	22.2		
100001-150000	36	41.4			15	33.3		
≥ 150001	14	16.1			10	22.2		

Source: Field Survey, 2023 SD = Standard Deviation

3.2. Level of Participation of Males and Female in Agro-Based Income-Generating Enterprises

The result in Table 3 shows the level of participation of men and women in agro-based income-generating activities in the study area. Most male respondents fully participate (70.6%)

in on-farm activities while 60.0% fully participate in off-farm activities. 74.2% of female respondents fully participate in off-farm activities while 60.0% fully participate in on-farm activities. This contradicts the findings of Kayode *et al.* (2019) which recorded low participation of

women in off-farm activities. Enterprises like pig farming, mushroom farming, fruit and vegetable farming, greenhouse farming, horticulture, hay, silage and forage production, food vending, sales of poultry products, cassava processing, grains,

and oilseed processing, poultry processing and textile making recorded full participation among both male and female respondents. This implies that most agro-based activities require full participation to fully enjoy the benefits.

Table 3. Level of Participation of Males and Females in Agro-Based Income-Generating Enterprises (n=132)

Agro-based income activities	MALES (M.S)	FEMALES (M.S)
On-Farm Enterprises		
Grain crops farming	2.5	2.8
Tuber farming	2.6	0.0
Ruminant farming	2.7	0.0
Pig farming	3.0	3.0
Poultry farming	2.9	2.7
Beekeeping	2.5	0.0
Fishery and Aquaculture	2.6	2.6
Mushroom farming	3.0	0.0
Fruit and Vegetable farming	3.0	2.0
Greenhouse farming	3.0	0.0
Nursery practices	2.0	0.0
Horticulture	3.0	0.0
Hay, Silage, and Forage production	2.8	3.0
Agricultural machinery and equipment operation	2.0	0.0
Farm Labour	2.0	0.0
Total	2.71	2.64
Off-Farm Enterprises		
Food vending	0.0	3.0
Sale of fruits and vegetables	2.0	2.5
Sales of poultry products	2.6	3.0
Palm oil processing	0.0	1.5
Cassava processing	2.7	3.0
Grains and Oilseed processing	2.3	3.0
Breadfruit processing	2.0	0.0
Poultry processing	2.0	2.0
Diary processing	2.8	2.5
Textile making	2.8	3.0
Basket weaving	0.0	2.75
Bagging and packaging of grains	2.7	2.3
Training and Consultation	2.75	2.8
Total	2.63	2.71

Source: Field Survey, 2023 M.S = Mean Score

3.3. Categorization of Level of Participation of Male and Female in Agro-Based Income Generating Enterprises

It can be observed in Table 4 that both males and female recorded high levels of participation in agro-based activities with a high mean score of

2.67 and 2.68 respectively. This implies that respondents in the study area participate actively in agro-based activities. This aligns with the work of Onya *et al.* (2020) which recorded the full participation of respondents in agro-based activities especially on-farm activities.

Table 4. Categorization of Level of Participation of Male and Female in Agro-Based Income-Generating Enterprises

Categories	Sex	Frequency	(%)	Mean (SD)	Min	Max
Low	<1	Male	0	0.0		
		Female	1	100.0		
Moderate	1-2	Male	21	65.6	2.67 (.456)	1.00
		Female	11	34.4	2.68 (.325)	3.00
High	>2	Male	66	66.7		
		Female	33	33.3		

Source: Field Survey, 2023 SD = Standard Deviation

3.4. Factors Influencing Gender Participation in Agro-Based Income-Generating Enterprises

The result in Table 5 summarizes the factors influencing male and female participation in agro-based income-generating activities. Most men agreed that Desires for independence and contribution to family income (M.S=4.06) ranked first followed by the bargaining power of individual affects participation. (MS=3.94), gender-specific extension services influence participation (M.S=3.90) next cultural beliefs and practices limit gender participation in agro-based enterprises, (M.S=3.89). However, most females

agreed that increased empowerment (M.S= 3.92), desires for independence and contribution to family income (MS=3.83), cultural beliefs and practices (MS=3.80) as well as gender-specific extension services and training programs influences participation (M.S=3.78) in agro-based income generating enterprises. This finding support the assertions of Egwuonwu & Iwunwanne (2020), Iyiola & Azuh (2014) and Onwurafor & Enwelu (2013), that the desires for independence and contribution to family income make most women get involve in agro-based entrepreneurial activities.

Table 5. Factors Influencing Gender Participation in Agro-Based Income Generating Enterprises

Factors	Male	Female
Desires for independence and contribution to family income	4.06	3.83
Bargaining power of individual affects participation.	3.90	3.70
Gender-specific extension services and training programs influences participation for increased empowerment	3.85	3.80
Cultural beliefs and practices limit gender participation in agro-based enterprises.	3.80	3.92
Double burden of work, caring for the family and household chores	3.80	3.80
Social norms and expectations limit involvement in agro-based income generating enterprises.	3.00	3.76
Availability of raw materials and agro-based inputs for production influence participation.	3.87	3.64
Lack of support and mentorship for entrepreneurs in agro-based income generating enterprises hinders participation.	3.85	3.62
Appropriate skills and knowledge in agro-based activities alter people who want to participate in the enterprises.	3.83	3.56
Access to markets and marketing channels for agro-based products.	3.83	3.62
Some government's policies and regulations do not favor gender participation in agro-based income generating enterprises.	3.83	3.42
Community remoteness and poor communications with Agro-based industry.	3.78	3.47
Education and training opportunities affect ability to participate effectively in agro-based income generating enterprises.	3.76	3.40
Gender-based discrimination influences unequal access to resources and opportunities in agro-based income generating enterprises.	3.74	3.64
There are gender-specific roles in agricultural production and decision-making.	3.69	3.78
Lack of support and encouragement from family and community members.	3.68	3.27
	3.64	3.60

Source: Field Survey, 2023

3.5. Constraints to Gender Participation in Agro-Based Income-Generating Enterprise

The result in Table 6 highlights constraints to male and female participation in agro-based income generating enterprises. The majority of male respondents considered lack of education and training, farmland inadequacy, time constraints, poor transportation system, insufficient finance, lack of access to resources,

unfavorable climatic conditions, poor processing and storage facilities, limited access to markets and inadequate access with extension agents to be severe constraints militating against participation in agro-based enterprises. The majority of female respondents considered gender inequality to be a severe constraint militating against participation in agro-based enterprises. This agrees with the findings of Paul *et al.* (2019) and Qing (2020).

Table 6. Constraints to Gender Participation in Agro-Based Income-Generating Enterprise

Constraints	Male	Female
Lack of education and training	4.38	3.84
Farmland inadequacy	4.20	2.20
Time constraint	4.18	3.64
Poor transportation system	4.06	2.38
Insufficient finance	4.01	3.80
Lack of access to resources	4.01	3.69
Unfavorable climatic conditions	3.99	3.71
Poor processing and storage facilities	3.98	3.40
Limited access to markets	3.94	3.31
Inadequate access to extension agents	3.94	3.49
Discrimination based on gender	2.95	4.04

Source: Field Survey, 2023

3.6. Results of Tested Hypotheses

H0₁: There is no significant relationship between the socio-economic characteristics of respondents and the level of gender participation in agro-based income-generating enterprises.

The result in Table 7 shows the summary of multiple regression analysis showing the determinants of the level of participation of respondents in agro-based enterprises. The independent variables significantly predict the level of participation of respondents in agro-based enterprises, $F(13,118) = .716$, $p < .05$, which indicates that the independent variables under study have a significant impact on the level of participation. Furthermore, the $R^2 = .731$ depicts that the model explains 73.1% of the variance in the level of participation of respondents in agro-based enterprises.

Furthermore, coefficients were further assessed to determine the influence of each of the independent variables on the dependent variable.

The result revealed that years of education ($t = 0.822$, $P < .05$) and years of experience in agro-based enterprises ($t = -0.027$, $P < .05$) had a positively significant impact on the level of participation of respondents in agro-based enterprises. This implies that the level of participation increased with an increase in these variables. The significant positive relationship between years of experience in agro-based enterprises and level of participation of respondents in agro-based enterprises implies that the more experienced the respondents are in agro-based activities, the more likely they participate in agro-based activities. Age ($t = -0.193$, $P < .05$), however, is revealed to have a negatively significant impact on the level of participation. This implies that the more advanced in age the respondents are, the less likely the respondents participate in agro-based enterprises.

Table 7. Regression Analysis Showing Relationship between Socio-Economic Characteristics and Level of Participation

Variables	r-value	Std. Error	t-value	Sig.
(Constant)	3.169	0.396	8.001	0.000
Age of the Respondents	-0.001	0.005	-0.193**	0.029
Sex	-0.047	0.093	-0.504	0.615
Marital Status	-0.025	0.078	-0.325	0.746
Religion	-0.087	0.083	1.037	0.302
Educational Years	0.038	0.046	0.822**	0.013
Household Size	0.033	0.027	1.224	0.223
Years of Experience in Agro-based Enterprise	0.000	0.010	-0.027**	0.038
Farm Size (in hectares)	-0.007	0.033	-0.224	0.823
Training in Agro-based Enterprise	-0.095	0.085	1.118	0.266
Monthly Income from Agro-based Enterprise (in Naira)	-7.305E-007	0.000	-0.702	0.484

a. Dependent Variable: Mean Level of Participation

Source: (Field Survey, 2023) **significant at 0.05level (2-tailed), R Square =0.731, Adjusted R Square = 0.029, F =0.716

H0₂: There is no significant difference between the level of participation of males and female in agro-based income-generating enterprises.

The result in Table 8 shows the hypothesis tested to check significant difference in the level of participation of respondents in agro-based enterprises between males (M =2.7069, SD = 0.42830, n = 87) and females (M = 2.6778, SD = 0.50176, n = 45). Using the Independent Samples T-Test, the result showed a difference that is statistically non-significant (>0.05) $t(130) =$

0.349, $p = 0.728$). The null hypothesis which suggested that there is no significant difference between the level of participation of males and female in agro-based income-generating enterprises is therefore retained. This implies that there is no mean difference in the level of participation for males and female. This finding is in agreement with Yusuf *et al.* (2015) which also indicated no mean difference in male and female participation.

Table 8. Independent Samples T-Test Showing the Significant Difference in Level of Participation between Male and Female

	N	Mean	Std. Deviation	Mean Difference	t	Sig. (2-tailed)	Decision
Male	87	2.7069	0.42830	0.02912	0.349	0.728	Not Significant
Female	45	2.6778	0.50176				

Source: Author's field survey 2023

4. Conclusion and recommendations

The study concludes that females make more income in agro-based income generating enterprises than males and also, more males engage in on-farm activities compared to females and more females engage in off-farm activities

compared to males. The overall level of participation in agro-based income generating activities of each gender was high. The most severe constraint militating against the level of participation in agro-based activities in the study area was the lack of education and training for

males and gender discrimination for females. The level of gender participation in agro-based income-generating activities in the study area was predicted by respondents' age, years of education, and years of experience in agro-based enterprise. The study, therefore, recommends that agricultural policies should be aimed at encouraging and promoting more women's participation in agro-inputs business with increased access to land and resources and also policy measures that will improve the skills and the educational level of the farmers will go a long way to reducing the number of unskilled labors while increasing on the number of skilled labor of the people in the study area.

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All authors are contributed in this research

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Institutional Review Board Statement

All Institutional Review Board Statements are confirmed and approved.

Data Availability Statement

Data presented in this study are available on fair request from the respective author.

Ethics Approval and Consent to Participate

Not applicable

Consent for Publication

Not applicable.

Conflicts of Interest

The authors disclosed no conflict of interest.

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