













Rumbek North vs Yirol West	-2.599	0.009*
<b>SAM 2017</b>		
Cueibet vs Rumbek North	-3.984	0.000*
Cueibet vs Yirol West	-.404	0.686
Rumbek North vs Yirol West	-3.580	0.000*
<b>MAM 2016</b>		
Cueibet vs Rumbek North	-3.811	0.000*
Cueibet vs Yirol West	-3.522	0.000*
Rumbek North vs Yirol West	-2.225	0.026*
<b>MAM 2017</b>		
Cueibet vs Rumbek North	-2.656	0.008*
Cueibet vs Yirol West	-2.367	0.018*
Rumbek North vs Yirol West	-3.580	0.000*

\*indicates significant difference at  $\alpha = 0.05$

The table above revealed that the existing significant differences of SAM MUAC in under-five children, are among the three possible combinations of the three counties (Cueibet vs Rumbek North, Cueibet vs Yirol West, and Rumbek North vs. Yirol West) across three years except in 2015 SAM MUAC and 2017 SAM MUAC between Cueibet and Yirol West. It also showed significant differences in MAM MUAC among the three possible combinations of the counties, across 2016 and 2017.

## Discussion

This study aimed to determine the impact of nutrition therapy programme on the prevalence of Severe Acute Malnutrition (SAM) and Moderate Acute Malnutrition (MAM) in three counties of war-torn Lakes State of South Sudan. In the results, and considering each county, there was a significant difference in SAM prevalence of Rumbek North County only, across the three years 2015, 2016 and 2017. It was also discovered that, there was a rising median values of SAM across the three years in the three counties the post-hoc analysis further revealed that the significant difference of SAM prevalence in Rumbek North was between the 2015 and 2017.

The possible reasons for these significant differences, in conjunction with rising median values of SAM prevalence (poor outcome) across the three counties, were as suggested by the report of a similar study (Mwanza et al, 2016) on the outcome of the Outpatient Therapeutic Program (OTP), which is the nutrition therapy programme for SAM cases of under-five children, in three districts of eastern province in Zambia. These include; dependence on donor-funds, consistent stock outs of ready-to-use therapeutic food and other supplies, high volunteer dropout, and inadequate monitoring and feedback on defaulters, all of which are applicable in the three counties under this study.

Taking the MAM prevalence into consideration, the result revealed significant differences in each of the three counties across the three years. It also showed a rising median values of MAM prevalence (poor outcome) in Rumbek North and Yirol west across the three years. The result of the post-hoc analysis further revealed that, the significant difference in MAM prevalence, across the three years, in Cueibet and Rumbek North is between 2015 and 2017, while in Yirol west are both between 2016 and 2017, and between 2016 and 2017. This may be attributed to possible reasons, as suggested by Neitzel (2011) in a study conducted in five regions in Ethiopia (Tigray, Afar, Amhara, Oromia and SNNPR), to determine the impact of Targetted Supplemetary Feeding Programme (TSFP), which is the therapeutic program for MAM cases in under-five children, across five years, 2007-2011. The study suggested large proportion of children enrolled were not acutely malnourished, poor compliance, which is food sharing among other non-malnourished children, and increased food insecurity during the follow-up, all of which are closely applicable in the context of this study, as possible reasons.

Considering the relationship among the three counties, the results of this study showed that, there are significant differences in SAM prevalence, among the three counties, across the three years-2015, 2016 and 2017. It also showed significant differences in MAM prevalence, among the three counties in 2016 and 2017. The post-hoc analysis further revealed that, the existing significant differences of

SAM prevalence in under-five children, are among the three possible combinations of the three counties (Cueibet vs Rumbek North, Cueibet vs Yirol West, and Rumbek North vs. Yirol West) across three years except in 2015 SAM and 2017 SAM between Cueibet and Yirol West.

The results of this study also showed significant differences in MAM prevalence among the three possible combinations of the counties, across 2016 and 2017. The significant differences in SAM prevalence among the three counties, in the three possible combinations, across the three years, and MAM prevalence among the three possible combinations, among the three counties, across 2016 and 2017, may not be unconnected with the fact that, each county do not get supplies of the food supplements in the same simultaneous periods and that the differences in the distances, in conjunction with variations in the non-pliability of the roads to each county, for food supplement distribution, may be responsible reasons. Additional factors like the variations in diagnosis according to standard by the Community Nutrition Volunteers (CNVs) and Community Health Workers (CHWs) in each county using MUAC tapes, and political sentiments in health policy implementation as it relates to nutrition therapy programme, may also be responsible for these significant differences.

## **Conclusion**

The results obtained from this study do not support the null hypotheses of the study. The first null hypothesis states that, there will be no significant differences in the prevalence of SAM and MAM among under-five children in each of the three counties, across the three years in Lakes State of south Sudan. The results of this study showed conspicuous significant differences in SAM and MAM prevalence in each county across the years. Factors recognized for the significant differences in SAM and MAM values, coupled with poor intervention outcome, ranges from dependence on donor-funds, consistent stock outs of ready-to-use therapeutic food and other supplies, high volunteer dropout, inadequate monitoring and feedback on defaulters, to large proportion of children enrolled were not acutely malnourished, poor compliance, and increased food insecurity during the follow-up. The second null hypothesis which states that, there will be no significant differences in SAM and MAM prevalence among under-five children in the three counties, across the three years in Lakes State of South Sudan, was also at variance with the results of this study, as there were various significant differences in SAM and MAM prevalence among the three counties, across the three years. The possibility of each county not getting supplies of the food supplements in the same simultaneous periods, the differences in the distances and non-pliability of roads for hitch-free food supplements supply, variations in diagnosis according to standard by CNVs and CHWs in each county using MUAC tapes, and political sentiments in health policy implementation as it relates to nutrition therapy programme, were suggested as possible reasons for these significant differences, and poor impact.

In overall, this study has shown that, despite the various interventions of international organizations, like United Nations Children Emergency Fund (UNICEF) as the major donor for OTP programme for SAM cases, and World Food Programme (WFP) as the major donor for TSFP programme, for MAM cases, in south Sudan, with the duo working in collaboration with other International Non-governmental Organizations (INGOs), to implement nutrition therapy programme, the impact of the programme in the three counties, in Lakes State of south Sudan, as revealed in this study, is still at abysmal level. Complete overhaul of the programme, including training and re-training of CNVs and CHWs for correct screening, timely availability of food supplements, enactment of every possible policy to ensure food security, unwavering adherence to the principle of neutrality and impartiality on the part of INGOs and government, and conduct of pre and post-intervention surveys to communicate feedbacks, and help in re-evaluations, may serve as the panacea towards the present unsatisfactory state of the nutrition therapy programme in the Western Lakes State of south Sudan.

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