

Original Research Article

Overcoming obstacles in taluk nutritional rehabilitation centres - baby steps

Sandhya Viswanathan^{1*}, Alok M. Janardhan², Mahesh M. Shivanna³

¹Department of Paediatrics, Crawford General Hospital, Sakaleshpur, Hassan, Karnataka, India

²Department of Paediatrics, Shrinivasa Nursing Home, Sakaleshpur, Hassan, Karnataka, India

³Crawford General Hospital, Sakaleshpur, Hassan, Karnataka, India

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*Correspondence:

Dr. Sandhya Viswanathan,

E-mail: drsandyvs@gmail.com

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ABSTRACT

Background: While the effectiveness of nutrition rehabilitation centres (NRC) in combating severe and moderate malnutrition has been proven beyond doubt, their ability to reach out to all the target population is limited. The consensus of several studies is that NRCs are “under-utilized.” Hence, with a goal to improve utilization of NRCs, we aimed to set-up an assist system that may enhance the outreach of modified nutritional rehabilitation centre (mNRC)/taluk NRC by enrolling more children within the existing ecosystem and thereby combat the malnourishment of under-5 children in the community.

Methods: A rural facility-based, longitudinal, rehabilitative, case control pilot study conducted over a period of 1 year from March 2023 to March 2024 in our mNRC, Crawford General Hospital, Sakaleshpur. Our study compared the results between 2 groups, the conventional admission group, and the day-care group. The outcome parameter of percentage weight gain was used as the control variable.

Results: The percentage weight gain assessed in our study showed that the weight gain in the day-care clinics was comparable to the admitted children with no statistically significant difference.

Conclusions: Day-care clinics are an effective, feasible, practical adjuvant to mNRC that may be established at taluk as well as community health centre levels. This novel Assist System can overcome the difficulty of poor bed occupancies in NRC and boost the compliance and hence improve the community outreach for nutritional rehabilitation manifold.

Keywords: Nutritional rehabilitation centre, NRC, Modified NRC, Taluk NRC, Day-care clinic, Acute malnutrition

INTRODUCTION

The National Family Health Survey 5 (2019-21) states that in India 19.3% of children below 60 months of age have acute malnutrition, and 7.7% of children have severe acute malnutrition.¹ Karnataka statistics stand at 19.5% and 8.4% respectively for acute malnutrition and severe acute malnutrition (SAM).² Median case fatality rate in children with SAM is approximately 23.5%, which may reach 50% in edematous malnutrition.³ The nutritional rehabilitation centre (NRC) is a one-of-a-kind initiative by the National Health Mission of India, that is directed towards treatment

and rehabilitation of malnourished children up to the age group of 5 years, originally set up in district hospitals across India.⁴ Karnataka state government has extended the initiative to establish the same in taluk hospitals, in the form of modified nutrition rehabilitation centre (mNRC) which cater to both severely and moderately malnourished children.

The NRCs have been effective in improving the health status of those admitted, with significant weight gain being recorded among children.⁵⁻⁸ However, the biggest obstacle to comprehensive combating of undernutrition is poor

patient compliance and difficulties faced by the caregivers in dedicating 14 days to hospital stay. Multicentric studies show that the bed occupancy rates waver around 40% in NRCs.⁵ A multicentric study conducted in north Karnataka showed that 37% of NRC admissions were discharged against medical advice due to unwillingness of parents to stay.⁵ A review article by Dhawan et al states that the outcome of NRC is limited by high default rates of 49%.⁶ Even a tertiary apex institute like AIIMS Raipur recorded only 83.85% as the average bed occupancy per month.⁷ Thus, the consensus is that NRCs are “under-utilized”.⁵

While the effectiveness of NRC in combating severe and moderate malnutrition has been proven beyond doubt, as indicated by several studies their ability to reach out to all the target population is limited.

Need for study

Hence, with a goal to improve utilization of NRCs, we aimed to set-up an assist system that may enhance the outreach of mNRC by enrolling more children within the existing ecosystem and thereby combat the malnourishment of under-5 children in the community.

Aims and objectives

Aims and objectives were: to compare the weight gain in children with acute malnutrition under 5 years of age attending day-care clinic in mNRC, with the weight gain in children with acute malnutrition admitted in mNRC; to study the feasibility analysis of day-care clinics in mNRC; and to enlist the support systems and backup required for the smooth functioning of a day-care clinic.

METHODS

Study design

This was a rural facility based, longitudinal, case control pilot study conducted over a period of 1 year from March 2023 to March 2024 in our mNRC, Crawford General Hospital, Sakaleshpur. 42 children were included in the day-care group and 87 children admitted in the conventional mNRC ward formed the control group.

Inclusion criteria

Case group

All children with acute malnutrition under 5 years of age, who have refused admission in mNRC but were willing for the day-care clinic were included in the case study group.

Control group

All children with acute malnutrition under 5 years of age admitted in our mNRC during the study period who completed 14 days of hospital stay were included in the control study group.

Exclusion criteria

Unstable children with severe wasting/edema; children who did not complete the total duration of stay (14 days for control group and 4 weekly visits for case group) and children with chronic diseases (cerebral palsy/congenital heart disease).

Case group

The children and their parents included in the day care clinic group were asked to attend our mNRC facility once a week (Thursday) for 4 consecutive weeks from 9am to 4 pm in the evening. During the stay the children were assessed for any sickness, appetite (standardized appetite test), given the diet followed in conventional mNRC, and allowed to interact and play.

Mothers were taught, counselled, and trained about using Thai-card (MCP) for growth and development monitoring using charts, importance and insistence of play therapy, nutritional supplements and home-based diet in children and use of Pushti mix, immunization and breastfeeding benefits and immunisation defaulter identification and correction. Interactive group sessions, audiovisuals and IEC materials provided in mNRC were utilized for the same. Children were monitored for sequential weight gain, adequate food intake. All our key points were re-enforced in each visit.

Control group

Children admitted in our conventional mNRC ward who had completed 14 days stay.

Informed written consent taken from the parents and were persistently motivated for admission in mNRC wards. Only those who refused were given the alternative of a day-care clinic (such children would have been lost otherwise).

Statistical analysis

The distribution of weight gain among children in both case group and control group were analysed using percentage, line graphs and histogram. Null hypothesis was tested statistically, our null hypothesis being “there is no difference in the percentage weight gain distribution among children of the admission group and children of the day-care clinic group” using 2 sample t-test and then 2 sample F-test. P value of <0.05 was considered significant. Feasibility analysis in terms of resources, infrastructure, budget, and patient compensatory gains were compared between the two groups.

RESULTS

This study compared the results between 2 groups, the conventional admission group, and the day-care group over the stipulated period. Each group contained 2

subsections namely severe acute malnutrition (SAM) and moderate acute malnutrition (MAM). The demographic profile of the two groups is enlisted in Table 1. Our data showed that malnutrition of varying degree was more prevalent among females than male children (56.1% in day-care clinic group and 59.8% among admission

children). Prevalence of SAM was noted to be more in the age group of 1-3 years, across the 2 groups, whereas MAM was more prevalent in 3-5 years age group. Majority of our children in both case and control belonged to below poverty line group of society.

Table 1: Demographic profile of case and control groups.

Variables	Day care clinic (case)		Admission group (control)		Significance
	MAM	SAM	MAM	SAM	P value
Gender					
Male	18	1	18	17	0.5889
Female	21	2	28	24	
Age					
6 months-1 year	2	0	6	9	0.0064
1-3 years	17	2	29	22	
3-5 years	20	1	11	10	
Economic status					
APL	11	0	6	12	0.4831
BPL	28	3	40	29	

The outcome parameter of percentage weight gain (discharge weight-admission weight/admission weight $\times$ 100) was used as the control variable. The percentage weight gain in each group was further classified into 4 groups, ranging from >15% weight gain to <5% weight gain (Figures 1 and 2).

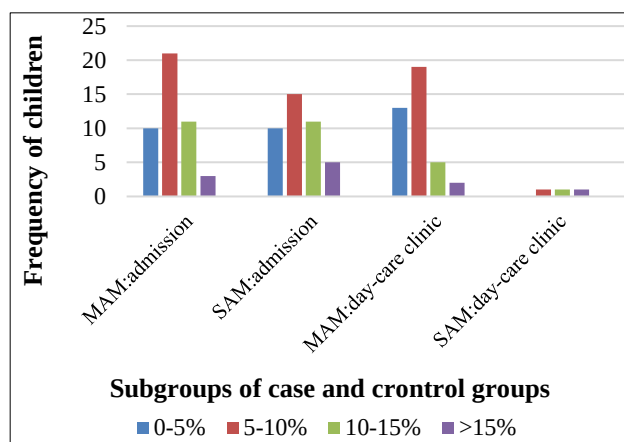


Figure 1: Percentage weight gain in different groups.

Out of the total admissions of 109 children 24 children dropped out (22.1%) and 33 children had developed mild-moderate facility acquired illness during their stay in hospital (30.2%).

We performed a 2-sample t-test to compare the means of the day-care clinic group and admission group on percentage of weight gain, among children with moderate acute malnutrition (Figure 3). The results showed $t(82) = 1.57$, $p = 0.119$. Thus, there was no significant difference between the groups on the outcome indicator. Further the two-sample f-test confirmed the same with results being ($F(44,38) = 0.89$, ns). Thus, the null hypothesis that “there is

no difference in the percentage weight gain distribution among children of the admission group and children of the day-care clinic group” was upheld true.

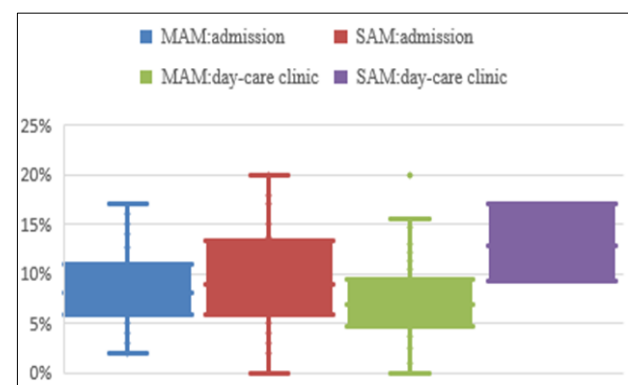


Figure 2: Distribution of percentage weight gain among different groups.

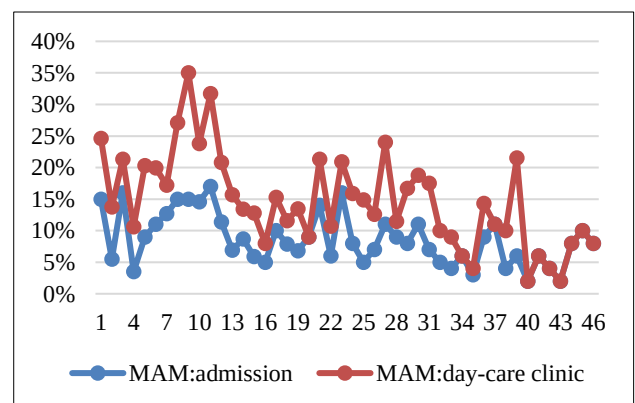


Figure 3: Comparison of MAM group distributions of admissions and day-care clinics.

DISCUSSION

Modified NRC of Sakaleshpur taluk caters mainly to the labourer and plantation worker groups. Our study showed that varying degrees of malnutrition was prevalent in the lower strata. We classified the economic status as above or below poverty line, based on the certificate of declaration, which is used in government setup to provide benefits. Our study showed that majority of the children belonged to below poverty line families, 75.6% among the case group, and 79.3% among the control group. However, there was no significance in the distribution among economic status between the case and control groups (p value 0.483). A study by Shalini et al showed a staggering 98.6% of the children belonged to lower strata, including children of unemployed or unskilled worker parents.⁹ Another study conducted in Shrinagar, showed that 83.6% children belonged to the lower strata of socio-economic status.¹⁰

The gender distribution of children with malnutrition showed higher prevalence among females than males (56.1% in day-care group and 59.8% in admission group). Our results resonate with other studies ranging 51.5%, 55.5%, 58%.⁹⁻¹² However, the Shrinagar study showed male predominance of 54.79%.¹⁰

The children between 1-3 years of age had higher prevalence of acute malnutrition in our study (54.68%), which correlates with the study conducted by Katole et al, with 59.2% across 4 different NRC.¹¹ The age distribution of children with acute malnutrition between day care and admission group was statistically significant in our study with a p value of 0.006. While highest prevalence of acute malnutrition was noted among 1-3 years of age, majority of parents of children aged 3-5 years refused admission and formed the bulk of day-care clinic group. Thus, poor compliance for NRC admission among children above 3 years of age is a note-worthy fact to be taken into consideration.

Modified NRC are taluk level facility-based nutrition rehabilitation centres. Karnataka presently has 86 mNRCs which are 5 bedded wards that tackle mostly stable cases of SAM and MAM thus relieving the burden on district hospitals and providing better community outreach. The major drawbacks observed in this revolutionary health initiative is poor compliance to hospital stay despite wage loss compensation. Multicentric studies of NRC in north Karnataka show that the bed occupancy rates of wards range between 20.4% to 52.9%.⁵ Another multicentric study in Odisha also showed that the bed occupancy was just over 50%.⁸ The drop-out rates in our mNRC was 22.1%, slightly lower than other studies which quoted 37% and 49%.^{5,6} In order to woo those deserving children whose parents were unwilling, we started this initiative for those parents not willing for admission and whose children were stable with a good appetite, mostly of MAM category. Hence, in our pilot study, we assessed the impact of novel facility based day-care clinics consisting of 4 weekly visits on the rehabilitation of acute malnutrition,

and compared the results with conventional mNRC admission children.

The outcome indicator in NRC is mainly the magnitude of weight gain achieved by children which may be assessed based on weight gain in grams/kg/day or percentage weight gain upon their admission weight. We chose percentage weight gain as our control variable due to discrepancy with the number of hospital days between the 2 study groups. Our study recorded about 9.3% among the admission group and 7.14% among the day-care group gaining >15% weight, 25.58% among the admission group and 14.28% among the day-care group gaining 10-15% weight, 41.8% among the admission group and 47.6% among the day-care group gaining 5-10% weight, 23.25% among the admission group and 30.95% among the day-care group gaining 0-5% weight (Figures 1 and 2). Similar results were noted in the multicentric study by Golandaj et al which showed that 70% of children gained <8% weight gain, 15.5% gained about 8-15%, and 3.8% gained >15% weight, while 10.7% children had no weight gain.⁵

The percentage weight gain assessed in our study showed that the weight gain in the day-care clinics was comparable to the admitted children with no statistically significant difference (2 sample t -test and 2 sample f -test) in the 2 groups. This observation goes hand-in-hand with WHO policies that community-based rehabilitation for stable acute malnutrition would certainly suffice.¹³

Feasibility analysis

We then analysed the feasibility of a day-care clinic setup in all mNRCs. The expenditure budget, required resources, infrastructure, and hospital beds for an mNRC admission and for a proposed day-care clinic are as tabulated below (Table 2). Our analysis shows that the day-care clinics are more economical for the government exchequer. At the same time the human resource, infrastructure does not require any new additions.

Proposition

Recognition and establishment of a day-care clinic in the same facility as the mNRC where children with acute malnutrition refusing admission may be called for 4 consecutive weekly visits.

Choosing the day of visit for the Day-care clinic to be on the day of the community's "market day (*Santhe- Dina*)" to ensure maximum compliance.

Consider the day-care clinic as an assist system or an adjuvant to NRC and not a replacement of NRC.

Support system and backup required

For the successful implementation of day-care clinics in NRC facilities, we recommend it to be introduced as an adjunct, not a replacement. There is a requirement of

establishment of a standardized operating protocol by the health department. Presently, there being no budget for the same, we request the government to sanction Budgetary allowance for each child attending the clinic and wage loss compensation for mother; for the 4 days that they attend. We also suggest a consideration for the establishment of day-care clinics in community health centres (CHC) levels.

Table 2: Feasibility analysis.

Parameters	mNRC admissions	Day care clinic
Human resource	Same	Same
Infrastructure	Same	Same
Number of hospital days	14 admission days	4 day-care days
Budget allocation presently	Rs. 125/day×14=1750 per child	None
Estimated expenditure per child	Rs. 1750	125×4= Rs. 500 per child (if allotted)
Wage loss compensation estimated, as per present guidelines	300×14=4200 per child	300×4=1200 per child (if allotted)
Total estimated budget	Rs. 5950 per child	Rs. 1700 per child (if allotted)
Maximum bed capacity per month	10	Several (>10)

Limitations

Our study (although with promising results) has been conducted in a single facility as a pilot study with limited sample size. Hence larger multicentric studies must be conducted to validate the findings. Another limiting factor is that the decision of 4 weekly visits is arbitrary.

CONCLUSION

Day care clinics are an effective, feasible, practical adjuvant to mNRC that may be established at taluk as well as community health centre levels. This novel setup can overcome the difficulty of poor bed occupancies in NRC and boost the compliance and hence improve the community outreach for nutritional rehabilitation manifold. Our study shows that day-care clinics shall be a valuable addition to the existing mNRC in combating malnutrition.

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