Community Medicine

MORBIDITY PATTERN AMONG SCHOOL CHILDREN IN A TRIBAL DISTRICT OF MAHARASHTRA: A DESCRIPTIVE STUDY BASED ON SECONDARY DATA.

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ABSTRACT

Background: India harbours one of the largest tribal populations in the world. Ashram schools are established in tribal districts, which are meant to uplift the education of tribal children. Rashtriya Bal Swasthya Karyakram (RBSK) was launched in 2013 to provide targeted and comprehensive health care to children aged 0 –18 years. This study targets to find morbidity patterns among them with the help of data collected by RBSK and to give suitable recommendations based on the findings **Methodology:** This secondary data-based observational descriptive study was carried out in two blocks of the Palghar district of Maharashtra State. After obtaining ethical approval and necessary permissions, health-related data of all Ashram School children collected by the RBSK team from November 2021 to October 2022 was retrieved and stored in electronic format. The proportion of different health problems was calculated. **Results:** Rashtriya Bal Swasthya Karyakram (RBSK) team screened 21,818 school children (49.4% boys and 50.6% girls) of the age group of 10-18 years from different Ashram schools for one year (November 2021 to October 2022). The team referred a total of 2016 students to higher medical facilities. Amongst the total screened 26.56% with 24 diseases as per the RBSK report. Additionally, 87% of students had 'Disease or Disorder', 5.8% had 'Deficiencies', 4.5% had any kind of 'Defect' and 2.7% had any kind of 'Developmental delay'. The majority of the students were affected by respiratory airway diseases (44.5%), menstrual problems (16.1%) and skin conditions (11.1%). **Conclusion:** Studying morbidity patterns under 4Ds approach enables intervention at an early stage of diseases. Capacity building of RBSK program and digitalised standard reporting system and integration of school health with other National Health Programmes may contribute to improving children's health.

KEYWORDS : Child health, childhood diseases, Rashtriya Bal Swasthya Karyakram, school health services, secondary data, tribal health

Introduction:

A child spends more time at school than in any other place, except his or her own home (Gokhale et al., 2017, 2014). Schools are considered holy places as they play a vital role in acquiring skills and development of intelligence children, which may help the children to achieve their lifetime goals and become good and responsible human being (2014; Gokhale et al., 2017). To achieve an optimum level of education, the health and well-being of a child is a fundamental subjects in the school-going age (Gokhale et al., 2017). By setting Global School Health Initiative, World Health Organization (WHO) has given the utmost importance to school health all over the world (Gokhale et al., 2017). In India, school health services were started in 1909, when a school in Baroda City carried out the first-ever medical examination of children (2021).

India harbours one of the largest tribal populations in the world and the lifestyle, literacy, occupation, food habits, nutritional status and knowledge of the tribal population have an enormous variety (Narayanan et al., 2021) . Therefore, the culture and upbringing of children in tribal areas have different perspectives than the rest of the urban areas and they face different challenges at their homes as well as schools (Borkar et al., 2022). Palghar district of Maharashtra State is one of the tribal districts in India and contains 'Ashram schools' or tribal residential schools which are specifically meant for tribal children. Including the health of these tribal children, The Ministry of Health and Family Welfare (MoHFW) launched the Rashtriya Bal Swasthya Karyakram (RBSK) in 2013 to provide targeted and comprehensive health care to children aged 0–18 years (Operational Guidelines Rashtriya Bal Swasthya Karyakram, 2013). RBSK aims to improve the quality of life with a special focus on improving survival outcomes for 'at risk' children (Singh et al., 2015).

India accounts for 20% of global child deaths with an estimation of 12.7 Lakhs deaths of under-five children per year (Under 5 Mortality Rate (U-5MR) (per 1000 Live Births) |; 2020., 2020, p. 5). A significant number of children die every year due to preventable diseases and infections, namely, respiratory infections, diarrheal diseases, other infectious and parasitic diseases and malaria (Under 5 Mortality Rate (U-5MR) (per 1000 Live Births) |; 2020., 2020, p. 5). Therefore to improve this situation, RBSK targets the screening of children with the help of medical officers, staff nurses, Auxiliary Nurses and Midwives (ANMs), and subsequently at home by Accredited Social Health Activists (ASHAs) as part of Home-Based New-born Care (HBNC) (Darivemula et al., 2020). The RBSK programme has two main goals, namely, early detection and management of the 4Ds (defects at birth, diseases in children, deficiency conditions and developmental delays including disabilities) and reduction of out-of-pocket expenditure (2016). Such screening methods were proven effective in early diagnosis of child morbidities(Gokhale et al., 2017). Palghar district, being a tribal area, has a substantial difference between tribal and non-tribal populations with regards to the healthcare (Birje et al., 2022). The tribal people including children suffer from a great burden of diseases like malnutrition, mental health, communicable diseases, non-communicable diseases and addictions possibly due to poverty, illiteracy, traditional practices and ineffective coverage of health services (Kshatriya, n.d., n.d.).Therefore, focusing particularly on Ashram school children, the current study targets to find morbidity pattern among them with the help of data collected by the RBSK team and to take necessary steps based on the findings.

Aims and objectives: The present study was aimed -

1. To assess the morbidity pattern among school-going children in a tribal district of Maharashtra.
2. To suggest suitable recommendations based on study findings.

Material and Methods:

The present study was an observational descriptive study based on secondary data. It was carried out for a duration of three months (March 2023 to May 2023) in Palghar, a tribal district of Maharashtra State. There were eight blocks in Palghar District, out of which two blocks were selected randomly by the lottery method. After obtaining ethical approval and necessary permissions from the concerned authorities, the list of all Ashram Schools in these two blocks was obtained and health-related data of all Ashram School children

collected by the RBSK team was screened. The data was retrieved from the Ashram school and student screening report from November 2021 to October 2022 (one year) and stored in electronic format. The proportion of different health problems as identified by the RBSK team was calculated. Data entry and analysis were done using Microsoft 365® Excel Spreadsheet (©Microsoft Corporation). Descriptive and proportional analysis was run on the collected data.

Results:
Rashtriya Bal Swasthya Karyakram (RBSK) team screened school children of the age group of 10-18 years from different Ashram schools. The target of screening was 1,48,575 students, however 21,818 students were present at the time of visit by RBSK and those only were screened by the team. Out of all the screened children 49.4% were boys and 50.6% were girls.

According to RBSK guidelines, the students are screened to identify the 4Ds (Defects, Deficiencies, Developmental delay, Diseases). The 24 diseases reported were categorised as given in Table 1.

Except for April and May 2022, the RBSK team screened a total of 21818 students and 2741 among them were found to have minor illness (Table 2). Student screening was lowest (n=989) in March 2022 and highest (n=3719) in February 2022. Sex-wise distribution of screen students in each month is given in Figure 1. The team referred a total of 2016 students to higher medical facilities. Twelve percent of students were found with minor illnesses (as classified by RBSK).

Amongst the total screened, 26.56% (n=5795) students were identified with the above listed 24 diseases. As classified by RBSK, 87% of students had 'Disease or Disorder' (Reactive airways disease being the most common), 5.8% had 'Deficiencies' (anaemia being the most common), 4.5% had any kind of 'Defect' (heart diseases being the most common) and 2.7% had any kind of 'Developmental delay' (eye problems being the most common) (Figure 2). The majority of the students were affected by respiratory airway diseases (44.5%), menstrual problems (16.1%) and skin conditions (11.1%) (Table 5). Detailed descriptive data of various diseases is presented in Tables 3–7. Except for November 2021, Reactive airway disease was the most common disease found in the students. Skin diseases, including fungal infections and scabies, were found in the highest numbers in November 2021.

Discussion:
Ashram schools are the residential schools in tribal areas, where tribal students stay in given residential facilities away from their homes and parents. These schools are nothing but the second home for such children. However, there are many Ashram schools where students come from nearby tribal villages and go back to their respective homes after school hours. s. The major obstacle found in the screening of students is low attendance at the time of actual screening. In the current scenario, only 14.68% of students could be screened due to high absenteeism at the time of the RBSK visit. A similar experience was noted by Gokhale et al. (2017), where they found only 41.7% of attendance (Gokhale et al., 2017). There can be several reasons for not attending school, and residing far from the school is one of them. Bose et al. (2019) showed similar findings and additionally noted the predominant involvement of parents in agricultural activities where the pupil is also engaged in helping them (Bose et al., 2019). Therefore it is essential to find out the factors associated with the absenteeism of students and take necessary steps to increase attendance. As attendance was low at the time of screening, it is speculated that the proportion of morbidity is underreported. To tackle the problem of absenteeism, home visits can be made with the help of ANMs and ASHAs to ensure near-complete reporting of diseases. This may help to understand the more detailed morbidity pattern and geographical areas which are in need of medical intervention as well as health education. Along with this improvised data collection standardization of the reporting system, reporting in bilingual formats (native as well as language of official use), and involvement of information technology (e.g. creating nationwide dashboards) may create a stronger database for further evaluation.

The current study showed, out of the total screened children, 49.4% were boys and 50.6% were girls. These numbers are roughly similar to Gokhale et al. (2017) who had 46% boys and 54% girls (Gokhale et al., 2017). Similar results were also found by Asghar et al. (2017) in Lucknow (48% boys, 52% girls) (Abid Asghar et al., 2017). The age group for the current study was 10-18 years, which is more than that of those taken by Madhusudhan et al. (2016) (6 weeks to 18 years), Rameshbabu et al. (2019) (0-18 years) and Darivemula et al. (2020) (0-18 years) (Darivemula et al., 2020; Madhusudhan et al., 2016; Rameshbabu et al., 2019). Additionally 26.56% percent of students were found to have diseases in 4Ds (defects at birth, diseases in children, deficiency conditions and developmental delays including disabilities). Disease in children (87%) was the most common category to be found prevalent (Figure 2). Madhusudhan et al. (2016), Rameshbabu et al. (2019) and Darivemula et al. (2020) had similar findings with a maximum proportion of child diseases (66%, 41.3% and 45.9% respectively) (Darivemula et al., 2020; Madhusudhan et al., 2016; Rameshbabu et al., 2019). Despite having an older age group, the proportion of the Defects category in the current study was 4.5%, which is roughly similar to the studies done by Madhusudhan et al. (2016), Rameshbabu et al. (2019) (Madhusudhan et al., 2016; Rameshbabu et al., 2019).

The most common disease entity in the current study was reactive airway diseases (44.5%), followed by menstrual problems (16.1%) and skin diseases (including fungal infections and scabies) (11.1%) (Table 7). This is in contrast with the findings of Gokhale et al. (2017) and Rameshbabu et al. (2019), which showed dental caries (61.1% and 23.2% respectively) as the most common entity found in the students (Gokhale et al., 2017; Rameshbabu et al., 2019). Madhusudhan et al. (2016) found more skin problems in the Disease category (Madhusudhan et al., 2016). It is interesting to note that both these studies showed very less proportion of reactive airways disease (19% by Gokhale et al., 2017; 5.4% by Rameshbabu et al., 2019) (Gokhale et al., 2017; Rameshbabu et al., 2019). Rameshbabu et al. (2019) studied a backward area in Tamilnadu state, but Gokhale et al. (2017) studied the same district as in the present study but with different areas (Gokhale et al., 2017; Rameshbabu et al., 2019).The differences in the current study and the study done by Gokhale et al. (2017) are presence of the COVID-19 Pandemic and age group of screened children (Gokhale et al., 2017). The data collection for the present study was done just after the second wave of COVID-19, which may explain the high proportion of reactive airway diseases in school students.

The common Deficiency found in the present study was anaemia. Madhusudhan et al. (2016) reported Severe Acute Malnutrition (SAM) and anaemia to be the most prevalent (Madhusudhan et al., 2016). Rameshbabu et al. (2019) and Darivemula et al. (2020) reported only anaemia as the most common deficiency. Additionally, the proportion of sickle cell anaemia/ Thalassemia was found to be 1.57%. Strengthening of screening may contribute in achieving the ambition of elimination of sickle cell disease (Bhushan, n.d.; Eradication of Sickle Cell Anemia, n.d.).

The present study only highlights the proportions of various morbidities among school children. To study the detailed epidemiology, long-term trends and associated factors, more systematic surveys are needed to understand the situation in remote tribal areas.

Limitations:
This study is based on secondary data collected by the RBSK team in selected tehsils, hence cannot be generalised. Furthermore, the age group taken here is 10-18 years which excludes a few diseases from the list of 4Ds of RBSK.

CONCLUSION:
RBSK was introduced in 2013 to provide targeted and comprehensive child health care. Studying morbidity patterns under 4Ds approach enables intervention at an early stage of diseases. The majority of morbidities identified during the screening were reactive airway disease, menstrual problems followed by skin diseases, whereas defects, deficiencies and developmental delay had a lesser proportion. Capacity building of RBSK program and digitalised standard reporting system and integration of school health with other National Health Programmes may contribute to improving children's health.

Table 1: Categorization of 4Ds under RBSK

DISEASE/DISORDER	-	A
DEFECT	-	B
DEVELOPMENTAL DELAY	-	C
DEFICIENCY	-	D

CATEGORY -A	CATEGORY -B
1. Reactive airways disease 2. Skin disease/fungal/scabies/etc 3. Febrile Illness 4. Diarrhoea 5. Dental caries 6. Worm infestation 7. Epilepsy 8. Hernia/ Hydrocele 9. Appendix 10. Cyst/Lyoma/Haemangioma 11. Renal calculus 12. Tuberculosis 13. Leprosy 14. Sickle cell anaemia/Thalassemia 15. Menstrual problems	1. Heart disease 2. Phimosis 3. Handicapped 4. Dumb and deaf
CATEGORY -C	CATEGORY -D
1. Eye/squint/RE 2. Learning Disability 3. ENT	1. Vitamin A Deficiency 2. Anaemia

Table 2: Proportion of students screened, having an illness, treated and referred by the RBSK team

Month of Screening	Target number of students to be screened by RBSK team (a)	Number of students screened (b)	Percentage of student screened (b/a*100)	Number of students having minor illness (c)	Percentage of students having minor illness a (c/b *100)	Number of students referred (d)	Percentage of students referred (d/b *100)
Nov-21	15674	2297	14.65%	132	5.7%	136	8%
Dec-21	15674	3144	20.06%	312	9.9%	217	9%
Jan-22	15674	2434	15.53%	250	10.3%	199	15%
Feb-22	15674	3719	23.73%	471	12.7%	372	11%
Mar-22	16124	989	6.13%	124	12.5%	91	11%
Jun-22	15674	2960	18.88%	651	22.0%	318	9%
Jul-22	15674	1953	12.46%	264	13.5%	222	11%
Aug-22	15373	1510	9.82%	187	12.4%	201	8%
Sep-22	15373	1950	12.68%	157	8.1%	170	7%
Oct-22	7661	862	11.25%	193	22.4%	90	6%
Total	148575	21818	14.68%	2741	12.6%	2016	9.3%

Table 3: Table showing the morbidity pattern among those who were identified with Category A by the RBSK team.

	Nov 21		Dec 21		Jan 22		Feb 22		Mar 22		Jun 22		Jul 22		Aug 22		Sep 22		Oct 22		Total	Prevalence of diseases amongst total
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
Reactive airways disease	21	17.4%	254	39.9%	180	46.6%	261	54.5%	639	70.1%	119	66.5%	475	54.0%	222	48.8%	294	46.4%	113	32.1%	2578	11.8%
skin disease/f	40	33.1%	94	14.8%	35	9.1%	59	12.3%	53	5.8%	12	6.7%	56	6.4%	59	13.0%	172	27.2%	63	17.9%	643	2.9%
Febrile Illness	3	2.5%	3	0.5%	7	1.8%	3	0.6%	12	1.3%	5	2.8%	26	3.0%	28	6.2%	19	3.0%	9	2.6%	115	0.5%
Diarrhoea	2	1.7%	0	0.0%	46	11.9%	0	0.0%	0	0.0%	0	0.0%	9	1.0%	7	1.5%	8	1.3%	9	2.6%	81	0.4%
Dental carries	40	33.1%	181	28.4%	0	0.0%	79	16.5%	45	4.9%	3	1.7%	61	6.9%	16	3.5%	21	3.3%	87	24.7%	533	2.4%
Worm infestation	0	0.0%	0	0.0%	2	0.5%	3	0.6%	0	0.0%	0	0.0%	21	2.4%	2	0.4%	6	0.9%	1	0.3%	35	0.2%
Epilepsy	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Hernia/ Hydrocele	0	0.0%	0	0.0%	0	0.0%	1	0.2%	3	0.3%	0	0.0%	3	0.3%	8	1.8%	2	0.3%	3	0.9%	20	0.1%
Appendix	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cyst/Lyoma/Haemangioma	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.3%	0	0.0%	2	0.0%
Renal calculus	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

TB	0	0.0%	1	0.2%	1	0.3%	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	0.0%
Leprosy	1	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.0%
Sickle cell anaemia/ Thalassemia	1	0.8%	9	1.4%	3	0.8%	30	6.3%	21	2.3%	0	0.0%	8	0.9%	7	1.5%	7	1.1%	5	1.4%	91	0.4%
Menstrual problem	13	10.7%	95	14.9%	112	29.0%	43	9.0%	138	15.1%	40	22.3%	220	25.0%	106	23.3%	102	16.1%	62	17.6%	931	4.3%
Total	121		637		386		479		912		179		879		455		633		352		5033	23.1%

Table 4: Morbidity trend of defects in students identified in Category B by RBSK team

Month	Handicapped		Dumb and Deaf		Phimosis		Heart disease	
	n	%	n	%	n	%	n	%
Nov-21	0	0.0%	0	0.0%	2	20%	8	80%
Dec-21	1	4.2%	0	0.0%	11	46%	12	50%
Jan-22	0	0.0%	0	0.0%	0	0%	7	100%
Feb-22	2	7.4%	0	0.0%	17	63%	8	30%
Mar-22	0	0.0%	0	0.0%	43	68%	20	32%
Jun-22	0	0.0%	0	0.0%	7	54%	6	46%
Jul-22	0	0.0%	0	0.0%	25	57%	19	43%
Aug-22	0	0.0%	0	0.0%	2	14%	12	86%
Sep-22	1	4.0%	0	0.0%	7	28%	17	68%
Oct-22	3	8.6%	0	0.0%	11	31%	21	60%
Total*	7	0.0%	0	0.0%	125	0.6%	130	0.6%

*The total percentages are the prevalence of defects amongst screened students.

Table 5: Table showing morbidity trend in students identified IN Category C by RBSK team

Month	Learning Disability		Eye/squint/RE		ENT	
	n	%	n	%	n	%
Nov-21	0	0.0%	5	83%	1	17%
Dec-21	0	0.0%	5	83%	1	17%
Jan-22	0	0.0%	2	50%	2	50%
Feb-22	0	0.0%	7	54%	6	46%
Mar-22	0	0.0%	13	65%	7	35%
Jun-22	0	0.0%	4	57%	3	43%
Jul-22	0	0.0%	18	67%	9	33%
Aug-22	0	0.0%	17	61%	11	39%
Sep-22	1	3.4%	17	59%	11	38%
Oct-22	0	0.0%	12	80%	3	20%
Total*	1	0.005%	100	0.5%	54	0.2%

*The total percentages are the prevalence of developmental delays amongst screened students.

Table 6: Table showing morbidity trend among students identified in Category D by RBSK team

Month	Anaemia		Vitamin A Deficiency	
	n	%	n	%
Nov-21	8	29%	20	71%
Dec-21	66	100%	0	0%
Jan-22	16	25%	48	75%
Feb-22	57	100%	0	0%
Mar-22	39	100%	0	0%
Jun-22	5	100%	0	0%
Jul-22	45	100%	0	0%
Aug-22	17	100%	0	0%
Sep-22	4	100%	0	0%
Oct-22	8	100%	0	0%
Total*	265	1.2%	68	0.3%

*The total percentages are the prevalence of deficiencies amongst screened students.

Figure 1: Sex-wise distribution of students screened by RBSK team from November 2021 to October 2022.

Sex-wise distribution of students screened by RBSK team from November 2021 to October 2022
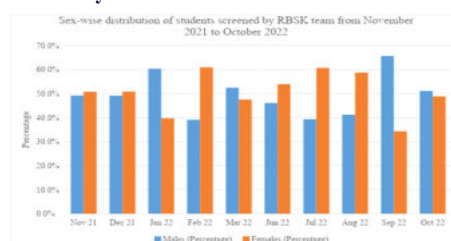
(Note: No screening was done in April 2022 and May 2022 due to summer vacation.)

Figure 2: Pie chart of categorization of diseases under 4Ds (as per RBSK report)
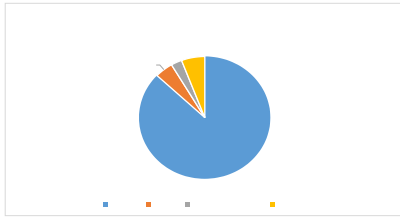
Table 7: Proportion of conditions screened by RBSK team. (n=5783)

Conditions screened in RBSK	Percentage
Reactive airways disease	44.58%
skin disease/fungal/scabies/etc	11.12%
Febrile Illness	1.99%
Diarrhoea	1.40%
Dental carries	9.22%
Worm infestation	0.61%
Epilepsy	0.00%
Hernia/ Hydrocele	0.35%
Appendix	0.00%
Cyst/Haemangioma	0.03%
Renal calculus	0.00%
TB	0.05%
Leprosy	0.02%
Sickle cell anaemia/ thalassemia	1.57%
Menstrual problem	16.10%
Handicapped	0.12%
Dumb and Deaf	0.00%
Phimosis	2.16%
Heart disease	2.25%
Learning DISABILITY	0.02%
Eye/squint/RE	1.73%
ENT	0.93%
Anaemia	4.58%
Vitamin A Deficiency	1.18%

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