

**EVALUATION OF THE WASH STRATEGY IN 3 NUTRITIONAL UNITS OF
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ABSTRACT

Summary: The WASH (Water, Sanitation, Hygiene) strategy aims to help reduce morbidity and mortality due to severe malnutrition in areas in nutritional crisis. The objective of this study is to evaluate its implementation in 3 Therapeutic Nutritional Units (UNT) of N'Djamena. **Patients and method:** this was a prospective, cross-sectional, descriptive study from September 2021 to February 2022 or 6 months. The study population consisted of carers of malnourished children and UNT staff. The variables studied were: socio-demographic characteristics of companions, knowledge of the WASH-NUT strategy in the UNTs, and the level of application by chaperones and staff. Data were entered using Word, Excel and were processed using SPSS version 18.0. **Result:** The 3 UNTs of N'Djamena: University Hospital Center (CHUME), Chad-China Friendship Hospital (HATC), Notre Dame des Apostles Hospital (HNDA) were evaluated. Accompanying persons aged 20-24 years were the most represented (32%) with a sex ratio of 0.03 M/F. The drinking water indicators of WASH NUT were 1/6 in CHUME; 4/6 in HNDA and 6/6 in HATC; Those related to the hygiene of the WASH system were at 4/10 for both UNT CHUME and HTC while the UNT of HNDA were at 7/10; The indicators related to the sanitation of the WASH system were 4/6 for the CHUME UNT and 5/6 for the two UNT HNDA, UNT HTC. **Conclusion:** The implementation of the WASH strategy in the 3 UNTs of N'Djamena is insufficient, an effort of ownership must be made by the stakeholders for extension in all health structures taking care of the malnourished. This must include community awareness and staff training.

KEYWORDS: Evaluation, strategy, WASH NUT, UNT, NDJAMENA.**INTRODUCTION**

WHO estimates that 50% of undernutrition worldwide is associated with infections caused by unsafe water, inadequate sanitation or poor hygiene.^[1] Poor water, sanitation and hygiene (WASH) interventions create the perfect conditions for the development of infectious diseases related to malnutrition.^[2] Without access to basic WASH needs, the lives of millions of children are at risk, especially in times of crisis.^[3]

Studies have shown that socio-economic factors, poor nutrition and mothers' lack of knowledge about food hygiene practices lead to an increase in the prevalence of malnutrition.^[4-5] The addition of a minimum WASH package in the management of children with SAM reduced the duration of treatment and increased the cure rate. Yet only 56% of the Chadian population has access to drinking water, with sanitation coverage limited to 16%, and hygiene conditions and practices often precarious.^[6] Chad, like other countries in the region, has adopted the "WASH in Nutrition" strategy, which was initiated in 2012 and revised in 2015 by the WASH West

and Central Africa Regional Group with the support of a large number of partners. The objective of this strategy is to help reduce morbidity and mortality due to acute malnutrition in areas in nutrition crisis by ensuring that the required "minimum WASH package" is delivered to nutrition facilities and the community.

To achieve this objective, strategic axes such as; the geographical integration of WASH in NUTRITION (WIN); the prioritization of the "mother/carer, malnourished child" couple of the nutritional center; the definition of the "minimum WASH package"; capacity building and communication for behavior change; resource mobilization for WIN and monitoring and evaluation of the implementation of the strategy and capitalization of experiences have been retained.^[7]

The government in its 2030 vision for Chad has set the objective of achieving water and sanitation coverage of 80% and 60% respectively.^[8] According to the SMART 2019 survey, 61% of households use an improved water source, 15.9% use improved latrines, 87.2% of

households that dispose of the feces of children under 3 years of age hygienically, 8% of households dispose of garbage hygienically. The evaluation of the 6 key handwashing moments defined by WHO showed that: hand washing before and after meals accounted for (61.0%), before preparing meals (39.1%), after touching dirt (20.8%), after going to the toilet (21.7%), before feeding children (16.3%) and after cleaning a child who had a bowel movement (14.5%).^[9]

Thus, the aim of this study was to evaluate the implementation of the WIN strategy in three NTUs in N'Djamena.

METHOD AND PATIENTS

The study was carried out in N'Djamena, Chad, in three Nutritional and Therapeutic Units (UNT) located at the University Hospital for Mothers and Children (CHUME) with a capacity of 30 beds, the Chad-China Friendship Hospital (HATC) with a capacity of 80 beds and the Notre Dame des Apôtres Hospital (HNDA) with a capacity of 60 beds.

These Nutritional and Therapeutic Units are responsible for the clinical, biological and therapeutic follow-up of

malnourished children with complications in accordance with the national protocol.

Activities include daily consultation and screening of children referred from the paediatric emergency department and/or from UNAs; daily medical examination of hospitalized cases; education and awareness sessions; follow-up consultations; ongoing staff training.

This was a cross-sectional, descriptive and analytical study that lasted 6 months (September 2021 to February 2022). It concerned the carers of MAS children, health personnel working in the UNT (Nurse, Doctor, nutritional assistants, nutritionists and hygienists). The means of investigation were the observation, verification and identification of WASH materials present in the NTUs; questionnaires were sent to accompanying persons and health and hygiene sanitation personnel who had agreed to participate in the study after explanations on the merits of the study. Indicators related to drinking water, hygiene and sanitation WASH-NUT were assessed.

Table I: Drinking Water Indicator.

Drinking Water Indicator Audit
1) Access to a drinking water point for patients, carers and providers
2) Water for consumption is treated with each supply/filling of the tank
3) The chlorine residual test is systematically done at the point of drawdown Minimum 1 time / 24h (recorded in an up-to-date register of analysis results)
4) Chlorine residual 0.3 mg/l < x < 0.8 mg/l at the point of drawdown
5) The amount of drinking water is sufficient for patients and accompanying persons and cups are made available
6) Drinking water is stored properly until consumption

Hygiene Indicator Check

1) Each provider, malnourished or accompanying patient has access to at least 15l of clean water per day for the related hygiene needs.
2) 1 washbasin for each latrine block, site of preparation and taking of meals 1 shower/50 people and separated by gender with a drainage system for each shower block.
3) At least 1 washing area in the structure with a drainage system.
4) There is soap/ash and water available at each hand washing point, washing areas, shower block.
5) The person in charge of awareness has been trained on key messages and communication techniques.
6) The person in charge of awareness carries out at least 1 daily awareness session and records it in a register.
7) The structure has at least: picture boxes, posters in visible places.

Table III: WASHNUT Sanitation Indicators.

Sanitation Indicator Audit
1) There is at least 1 hygienic latrine (without flies, odors, cutlery, clean, etc.) for 25 adults or for 20 children separated by gender
2) Pots are available for each pediatric bed (nb of pot = nb of bed)
3) 1 garbage hole
4) 1 incinerator with ash hole protects away from patients
5) Absence of medical / non-medical waste visible within the centre and in the immediate vicinity
6) A standardized sanitation kit is available at the level of the structure with disinfectant products and dedicated staff trained for this task.

The data collected related to

- Socio-demographic characteristics: profile of the accompanying person (age, sex, place of residence; socio-economic status of accompanying persons; and staff (function; experience)
- Epidemiological characteristics: Knowledge of diarrhoeal diseases;
- Knowledge and practice of accompanying persons on community WASH NUT (knowledge on access to water, knowledge on sanitation, knowledge and practice of hygiene and awareness on WASH at home)
- Indicators of the quality of delivery of UNTs (water, hygiene and sanitation).

This study had obtained the favourable opinion of the ethics commission of the Faculty of Human Health Sciences of N'Djamena. She had informed consent from parents and staff for their agreement and respect for confidentiality. Data entry and analysis was performed using SPSS 20 software.

RESULTS

The average age of accompanying persons was 25 years with extremes ranging from 15 to 55 years, with a sex ratio of 0.03H/F. Mothers were in 91% of cases married with 78.2% of residence in N'Djamena. They were out of school in 59.4 per cent of cases, at primary (12.9%), secondary (22.8%) and university (5 per cent) levels.

Staff qualifications and professional experience**Table IV: Staff Profile in the 3 UNTs.**

Profession	CHUME	HNDA	HATC	%
Pediatrician	1	0	0	1,03
Med. Generalist	4	1	1	6,18
Nutritionists	0	4	4	8,24
State-certified nurse (IDE)	13	14	13	30,92
Technical Health Officer	2	2	2	6,18
Hygienists	5	2	2	9,27
UNT Supervisor	1	1	1	3,09
Assistant Nutritionists	8	8	8	24,74
Total	34	32	31	100

The staff of the UNTs were nurses (30.92%), nutritionists (8.24%), technical health officers (ATS) in (6.18%), assistant nutritionists (24.74%), doctors (6.18%) and hygienists (9.7%). Only the UNT of CHUME has a Pediatrician.

In 35.5% of cases, these staff had only less than 1 year's professional experience.

Complications of malnutrition

Diarrhoeal morbidity is found in SAM children under 5 years of age in 33.85% of cases. It is 65.34% of cases in malnourished children.

Regarding the knowledge of accompanying persons about the causes of diarrhea in children under 5 years of age, they are unknown in 48.5% of cases. We reported in 18.8% "teething"; "poor adaptation to artificial milk" in 13.9% and only 1% know that "defecating in the open" was one of the causes.

Table V: Mothers' knowledge of diarrhoeal disease prevention.

Means of prevention of diarrhoeal diseases	n	%
Drinking drinking water	7	6,9
Use latrines	5	5,0
Keeping a clean environment	7	6,9
Clean the storage container regularly	8	7,9
Wash your hands	22	21,8
Protecting food from flies	15	14,9
Cover the storage container	4	4,0
Don't know	72	71,3

Regarding the knowledge of accompanying persons on the means of prevention of diarrhoeal diseases, 71.3% did not know how to avoid diarrhea, the means of prevention cited in descending order were: "wash hands before eating" in 21%; "protect food from flies" in 14.9%. Less than 5% knew that "covering the storage

container" or "using latrines" were also means of preventing diarrhoea.

Water supply and treatment

The attendants who obtained drinking water were 98%, those who stored water adequately (in clean and covered

containers) at home were 95%, 2% had as a source of water (well and unprotected borehole, river). The survey showed that 76.2% of accompanying persons were familiar with water treatment methods. Of those who treated their water, 58.4% used chlorine and 14.9% boiled or filtered it.

Stool and household waste management

The use of hygienic latrines is found in 86.73% of cases. Good management of infants' stool by caregivers is

Raising awareness about WASH in the 3 UNTs

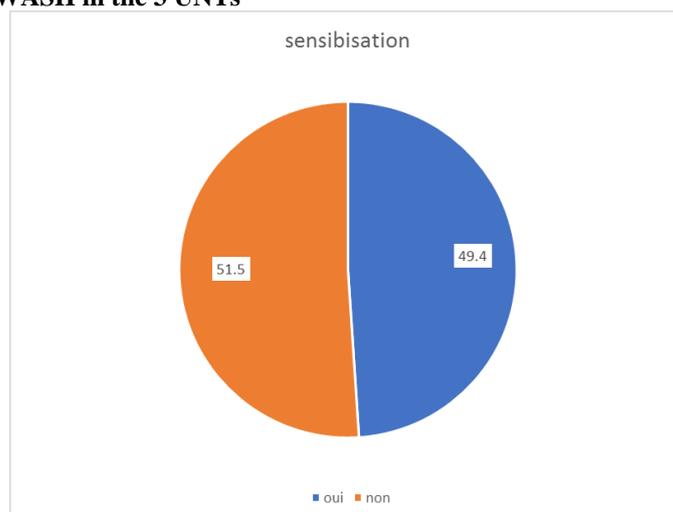


Figure: Distribution of carers sensitized at home on WASH.

Accompanying persons benefited from awareness-raising on water treatment methods (70.3%) and handwashing methods (86.1%) in the various NTUs in N'Djamena.

Evaluation of indicators in the 3 sites

The drinking water indicators of the WASH system were 1/6 in UNT1 CHUME, 4/6 in UNT2 HNDA and 6/6 in UNT 3 HATC.

WASH hygiene indicators were 4/10 for UNT1 CHUME and UNT3 HTC, 7/10 for UNT2 HNDA.

The indicators related to WASH System Sanitation were 4/6 for UNT1 CHUME and 5/6 for both UNT2 HNDA and UNT3 HTC.

DISCUSSION

In this series, the average age of the accompaniments was 25 years. This average age is lower than that of Mohamed.^[13] in Bamako, Mali in 2010 who notes an average age of 30 years.

The accompanying persons were women in 97% of cases with a sex ratio of 0.03 M/F. these results are higher than that of BA Ousmane in Mali in 2019 which finds 92.5% of women with a sex ratio of 0.07 M/F.^[11]

The educational level of accompanying persons was very low in the three UNTs with 59.4% of accompanying

persons not attending school. This result is close to that of the SMART survey in 2019 which reports 63.5% of people out of school.^[9] However, it is lower than that of BA.^[11] which finds 87.6% of people out of school.

Observation of hand washing

Handwashing is observed in 98% of cases. The use of soap and water in practice is 58.6%.

The high rate of out-of-school education can be attributed to socio-cultural factors. Indeed, in Chad, according to data from the 2015 demographic and health survey, 62% of women and 36% of women aged 15-49 are out of school.

Taking into account professional experience, we observe that 35.5% of the staff had a professional experience of less than one year, this lack of experience could have a negative influence on the care of malnourished children and the awareness of accompanying persons.

Considering the complications of malnutrition, we note a diarrhoeal morbidity rate in children under 5 years of age of 33.85%. This result is lower than that of Saidou et al.^[10] in Niger in 2018 who found 38% diarrhoeal morbidity in the intervention area and in the control area. This morbidity rate in the study could be explained on the one hand by the compliance with minimum WASH standards in the intervention areas due mainly to the use of disinfectant products (present in the Win kit), and on the other hand by the effectiveness of community awareness programmes and the participation of mothers in the implementation of the project.

Regarding the causes of diarrhoeal diseases, they are unknown by 48.5% of accompanying persons. The same applies to means of prevention, which are known only by 71.3% of accompanying persons. This could be explained by the fact that accompanying persons had not benefited from the awareness on the WIN.

For water management, 95% of accompanying persons stored water adequately at home. This result is consistent with the WASH study.^[13] where 95% of households store water in containers with a narrow spout to avoid or minimize contamination.

Considering water treatment methods, 76.2% of accompanying persons were familiar with water treatment methods. This rate is lower than that of WASH plus^[13] which reports that 91% of caregivers know how to treat water. In general, drinking water treatment is not yet a common practice for the majority of households. The reasons why drinking water was not routinely treated was that it was already considered safe to drink.

Regarding the use of latrines, 86.73% of accompanying persons used hygienic latrines. This result is lower than that of Diakit .^[12] in 2015 in Mali which finds that 90.78% users of latrines. However, it is higher than the SMART survey which reports a latrine utilization rate of 65.5%. This justifies Diakit 's assertions.^[12] that better management of human excreta through access to and use of appropriate latrines is one of the first conditions for avoiding and/or reducing the spread of pathogens in the household environment.

Compared to awareness-raising, 51.5% of carers were not aware of WASH at home. The lack of WASH-focused communication in our communication channels could explain this result.

The drinking water indicators of the WASH system were low (1/6) in the UNT1 CHUME, 4/6 in the UNT2 HNDA but reached 6/6 in the UNT3 HATC. The involvement of the NGO Alerte Alima / sante at the UNT of HATC, and the better management of drinking water in this UNT thanks to the means committed by the structure in place, could be at the origin of this performance.

The hygiene indicators of the WASH system were low 4/10 for both UNT1 CHUME and UNT3 HTC while UNT2 HNDA was close to an acceptable hygiene quality of 7/10. This lack of hygiene is due to the lack of appropriate personnel and equipment.

The indicators related to WASH sanitation were 4/6 for UNT1 CHUME and 5/6 for both UNT2 HNDA, UNT3 HTC. This shows that the remediation measures were not up to date. This would be due to the lack of appropriate means for the remediation works.

Saidou Tamboura et al^[10] find that the 12 UNICEF WASH standards are applicable to all health centres. All health centres in the intervention areas have met the minimum standard set by UNICEF's WASH in strategy. All patients and staff have access to a clean water point and handwashing facilities, and each health centre had a sanitation system and an improved latrine.

CONCLUSION

This study allowed us to evaluate the WASHNUT strategy implemented in the N'Djamena NTS. It appears that the strategy is effective in these NTUs but at various levels.

Several indicators deserve to be revised upwards. The means of implementation must be strengthened on the harmonization of WASH devices, the theoretical and practical training of staff and the sensitization of accompanying persons on the application of WASH principles. Only effective and continuous monitoring and evaluation of the implementation of these strategies could demonstrate over a long period of time the impact of WASH NUT on the management of severe acute malnutrition in NTUs.

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