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Original Research Article

Infant and young child feeding knowledge and practices among mothers of under-5 children in Nadia district, West Bengal: a cross-sectional study

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ABSTRACT

Background: Age-appropriate infant and young child feeding (IYCF) practice (exclusive breastfeeding till 6 months and adequate diet in a child aged 6-24 months i.e. age-appropriate number of food groups in sufficient amount and age-appropriate number of meals per day) and maintenance of hygiene are of paramount importance to promote child growth and survival. Despite several guidelines, IYCF remains an unsolved issue in the background of the significantly high proportion of malnutrition as well as under-five mortalities globally as well as in India. The current study aimed to assess the knowledge and practices related to IYCF among mothers and to find out the predictors of the same in a rural area of West Bengal.
Methods: A community-based cross-sectional study was conducted among 351 mothers of under-five children in Nadia district, west Bengal with the help of a pre-designed and pre-tested semi-structured schedule. Multi-stage random sampling was done. Data were entered into MS Excel and analysed in the SPSS 21.0 version.
Results: The study found that the majority (49.3% and 74.5% respectively) had an average knowledge and practice score related to infant and young child feeding. Bivariate analyses revealed that the mothers having educational levels more than higher-secondary had higher odds of good IYCF knowledge; also those who had experienced "ASHA's home visit within one month" had higher odds of good IYCF practice.
Conclusions: Adequate and consistent implementation of existing government policies can bridge the gap of knowledge and thereby practice of infant and young child feeding.

Keywords: Behaviour, Caregiver, Eastern India, Nutrition, Perception, Preschool children

INTRODUCTION

Childhood mortality still remains a matter of global concern inspite of remarkable progress in child survival in the past three decades.[1] According to WHO the global under-5 mortality rate is still high and India has a major contribution to it.[2] The latest UNICEF-WHO-World Bank joint malnutrition estimates show that globally more than 20% under 5 children are stunted and nearly 7% are suffering from wasting in 2022.[3] As per National Family Health Survey-5 (NFHS-5), under 5 mortality rate of India is 41.9 per 1,000 live births, and among children under 5 years 35.5% are stunted (height-for-age), 19.3% are wasted (weight-for-height) and 32.1% are underweight (weight-for-age).[4]

According to UNICEF, nearly half of all deaths in children under 5 are attributable to under-nutrition as it puts

children at greater risk of dying from common infections by increasing the frequency and severity of such infections and delay in recovery.[3] Not only that, early childhood is also considered the most rapid period of development in human life. First 1000 days of life i.e. the years from conception through birth to first few years of age are critical to gain healthy cognitive, emotional and physical growth of children. This in turn ensures optimum health and wellbeing in adult life.[5,6] Analyses, using the WHO Growth Standards also confirm the importance of the first two years of life as a window of opportunity for growth promotion.[6] As per NFHS-5, only 11.3%, of children aged 6-23 months are receiving an adequate diet and 63.7% of children are exclusively breastfed till 6 months of age.[4]

India's National Health Policy (NHP) 2017 envisages attainment of the highest possible level of health and well-being for all, including young children.[7] Since 2011, there was Home-Based New born Care (HBNC) program to ensure optimal health for new born implemented by the Ministry of Health and Family Welfare, GOI, under which Accredited Social Health Activists (ASHAs) should conduct home visits till 42 days.[8] However, there existed a loss of contact between child and healthcare system as after that, ASHAs only conduct household visits to mobilize children for immunization or in case when the child needs healthcare services. Considering the influence of diarrhoea, pneumonia, under-nutrition and the importance of WASH related interventions on overall child survival and development, addressing this gap was crucial. Therefore, additional home visits by ASHA between 3 and 15 months were proposed under Home Based Care of Young Child (HBYC) programme, launched in 2018 with the strategic goal to reduce childhood mortality and morbidity by promoting child nutrition with stress in frequency, amount and diversity of food for children 6 months to 2 years of age by Katori feeding concept as well as immunization, and hygiene practices and minimize common childhood illnesses.[6]

Nadia district of West Bengal is home to a population with substantial cultural diversity. Though HBYC was implemented here in the 3rd phase of FY 20-21, NFHS-5 data shows that, in this district, 26.1%, 17.6% and 25.1% of under 5 children are stunted, wasted and underweight respectively and also, only 17.4% children aged 6-23 months are getting adequate diet, which was 32.8% according to NFHS 4 data.[9] To achieve an Under 5 mortality rate of 23 by 2025 as per National Health Policy 2017, malnutrition among children must be addressed as the major preventable cause. Age-appropriate Infant and Young Child Feeding (IYCF) practice (exclusive breastfeeding till 6 months and adequate diet in a child aged 6-24 months i.e. age-appropriate number of food groups in adequate amount and age-appropriate number of meals per day) and maintenance of hygiene are of paramount importance. As mothers are the most important primary caregivers for children, assessing the infant and young child feeding (IYCF) knowledge and practice among mothers of under 5 children in the study area particularly given the HBYC Programme will help identify the gaps and prepare targeted strategies to meet them. There is a dearth of scientific reports on IYCF knowledge and practices among under-five children from West Bengal particularly after implementation of the HBYC program. Against this backdrop the current study aimed to assess the knowledge and practices of infant and young child feeding among mothers of under-5 children and to find out the predictors of the same in Nadia district of West Bengal.

METHODS

A community-based cross-sectional study had been conducted among the mothers of under-5 children in Nadia district West Bengal between February to July 2023. All the mothers who were present during survey, had given informed written consent and permanent resident (residing for more than 1 year) of rural area of Nadia district were included in the study. Informed written consent had been taken from every participant before interview and ethical clearance was obtained from Institutional Ethics Committee, Institute of Health and Family Welfare, Government of West Bengal.

Sample size had been calculated using Cochran's formula and considering p=adequate minimum acceptable diet among 6-23 months of children being 46%, 95% confidence level, 7.5% absolute error, design effect=2.[10] The final sample size had come to be of 339. Multistage random sampling was used. At first, one subdivision (Kalyani Sub-division) out of total 4 sub divisions of Nadia district had been selected randomly. In the second stage one block (Chakdaha block) of that subdivision had been chosen randomly out of three blocks. Thereafter 50% sub-centers of selected block had been selected randomly. So, total 32 sub- centers were visited. After obtaining line list of under 5 children of the selected subcenters from local ASHA 10-11 mothers were selected randomly from each subcenter following inclusion and exclusion criteria for interview.

The study tool consisted of a pre-designed pre-tested semi-structured schedule. The questionnaire had 2 parts. The first part was for socio-demographic characteristics of both mother and the child concern. The second part of the questionnaire was adopted from the sets of standardized questionnaires [Knowledge Attitude and Practice (KAP) questionnaire by Food and Agriculture Organization (FAO); Example Questionnaires published by WHO and UNICEF in 'Indicators for assessing infant and young child feeding practices-definitions and measurement methods' and Home Based Care for Young Child (HBYC) Operational Guidelines published by Ministry of Health and Family Welfare & Ministry of Women and Child Development, Government of India, in April 2008, as a part of 'POSHAN Abhiyaan' which has set the targets to prevent and reduce stunting & undernutrition amongst children in the age group of 0-6 years].[6,11,12] The set of knowledge questions were targeted to assess the respondent's knowledge related to early initiation of

breastfeeding, pre-lacteal feeding, exclusive breastfeeding, continuation of breastfeeding, proper age of initiation of complementary feeding, importance of complementary feeding and ideal amount and frequency of feeding for different age groups. Total 16 multiple choice and short answer type questions (7 related to breastfeeding knowledge and 9 related to age-appropriate feeding knowledge) were there and each correct response carried '1' mark, and any wrong response or 'do not know' response carried a score of '0'. The sum total of all individual marks was recorded as a knowledge score (maximum 16 to minimum 0). The knowledge level had been classified as above average (>10), average (5-10), below average (<5). The set of practice questions were targeted to assess the respondent's stated IYCF practices. This included breast feeding practice and current age-appropriate feeding practice in terms of amount and frequency. First 5 questions were related to breast feeding and complimentary feeding practices. One question was related to hand washing and hygiene. Each appropriate response carried '1' mark. Next 4 questions were related to age-appropriate feeding practices in terms of food amount, meal frequency and quality of food. Consumption foods from any 2 of the 3 recommended food groups was considered adequate. For children aged 2-5 years, if all 4 responses were at per recommendation, then a score of '1' was recorded for following age-appropriate feeding practices. For children aged 6months to less than 2 years, if all 4 responses were at per recommendation and are currently breastfeeding, then a score of '1' was recorded for following age appropriate feeding practices. For children aged less than 6 months who are currently breastfeeding exclusively, got '1' mark for age-appropriate feeding practice. The Sum of scores for breast feeding practice, hand washing and age-appropriate feeding practice was recorded as Practice score. [Maximum score 7- Minimum score 0, categorized as above average (>5), average (3-5), below average (<3)]. To capture the usual dietary habit of the child, 24-hour recall method was employed.

The questionnaire was first prepared in English. Then it was translated into Bengali by a linguistic expert, ensuring semantic equivalence. To verify the translation, it was retranslated into English by two independent researchers who were unaware of the initial English version. Face validity of each item was checked by previous researchers in the presence of public health experts. They also determined the content validity of each domain. Reliability was checked using the test-retest method. Pretesting and pilot testing were conducted. Necessary corrections and modifications were made to the questionnaire accordingly.

The collected data were entered into MS Excel and analysed using SPSS 21.0 software. Descriptive statistics were used to assess the socio-demographic characteristics of the mothers and children. For analytical purposes, the median scores for knowledge, practice and overall knowledge & practice were calculated and respondents were categorised into binary outcomes i.e. good (>median) and poor (≤median). Hence, to determine the knowledge outcome, a score greater than the median value was considered good, while a score up to the median was considered poor, similarly for practice and overall knowledge and practice the same method was applied. Bivariate analyses were conducted in SPSS to assess the determinants of IYCF knowledge, IYCF practice, and IYCF knowledge & practice. All statistical tests were two-tailed, and a p value <0.05 was considered statistically significant.

RESULTS

Total of 351 mothers were included in the analyses. The majority of the study population belonged to the age group of 21-26 years (46.1%) with a mean age of 25 years (SD 5.285). The study population was predominantly Hindu (84.7%), belonged to joint families (66.2%), SC (scheduled caste) by caste (52.3%) and had completed secondary/higher secondary (69.0%) level of education, housewives (91.2%) and with a per capita income ranging from Rs. 2460 to 4155. The largest proportion of the study population, accounting for 32.2%, fell into this middle-class range according to the Modified B.G. Prasad Scale 2022. The majority of children fell within the age range of 13-18 months (14%), with a mean age of 26 months (SD 15.8). Most of the children were the firstborn to the mother (60.5%) and the percentage of institutional delivery was 98.6%. It was observed that the majority of visits by ASHA (42.4%) occurred during the last month. Specifically, there were 73 home visits and 76 visits to the health centre in the last month.

Regarding knowledge of the mothers related to breastfeeding and initiation of complementary feeding, the majority (83.8%) reported that breast milk should be the first food of the babies, were aware of exclusive breastfeeding (92.3%), 68.8% reported that exclusive breastfeeding should continue from birth to 6 months while 71% of respondents reported that, breastfeeding should be continued up to 2 years or more. Only 42.2% of respondents had correct knowledge about the proper time of introduction of complementary feeding (i.e. 6 months) and 37.2% of mothers had the correct knowledge that, babies less than 6 months, should be put on breast on demand.

Regarding knowledge about meal frequency and amount of food per serving for 6-9 months children, only 18% and 23.4% respectively had correct knowledge; for 9-12 months aged children, it was 21% and 22.2% respectively; in the case of 1-2-year-old children it was 22.2% and 18.2% respectively and for children aged 2-5 years, 22.4% and 18.2% of the mothers respectively had the correct knowledge (Table 1).

Table 1: Mothers' knowledge related to age-appropriate infant and young child feeding (IYCF) (n=351).

Variables (knowledge related)		Frequency (N)	Percentage (%)
Knowledge about meal frequency for 6-9months child	2 to 3 times	63	18
	Don't know	284	81
	1 time	4	1
Knowledge about meal frequency for 9 to 12 months old child	3 to 4 times	74	21
	1 time	8	2.3
	Don't know	269	76.7
Knowledge about meal frequencyfor 1 to 2 year child	3 to 4 times	78	22.2
	2 times	5	1.4
	Don't know	268	76.4
Knowledge about meal frquency for 2 to 5 year child	3 to 4 times	79	22.4
	2 times	1	.3
	Don't know	272	77.3
Knowledge of snacks frequency for 6 months to 59 months old	1 to 2 times	58	16.52
	≥4 times	8	2.3
	3 times	21	6.0
	Don't know	264	75.1

Table 2: Frequency of meals and snacks given to children of different age groups (n=307, 6 months to 5 years).

Variables (practice related)		Frequency (N)	Percentage (%)
Frequency of meal given to 6-9 months old children (n=26)	2 to 3 times (correct)	17	65.4
	1 time	5	19.2
	≥4 (correct)	4	15.38
Frequency of meal given to 9 to 12 months old children (n=19)	3 to 4 times (correct)	15	79.1
	2 time	2	10.5
	1 time	2	10.5
Frequency of meal given to 1 to 2yr children (n=95)	3 to 4 times (correct)	59	62
	2 times	28	29.6
	1 time	2	2.1
	≥4 times (correct)	6	6.3
Frequency of meal given to 2 to 5Yr old children (n=167)	3 to 4 times (correct)	127	76
	2 times	35	21
	1 time	5	3
Frequency of snacks given for 6 to 9 months old child (n=26)	1 or 2 time (correct)	12	46.1
	3 times	6	23.0
	0 times	8	31
Frequency of snacks given for 9 to 12 months old child (n=19)	1 to 2 times (correct)	10	52.6
	3 times	4	21.1
	≥4 times	1	5.3
	0 times	4	21.0
Frequency of snacks given for 1 to 2yr old child (n=95)	1 to 2 times (correct)	57	60.0
	3 times	18	19.0
	≥4 times	5	5.2
	0 times	15	15.8
Frequency of snacks given for 2 to 5yr old child (n=167)	1 to 2 times (correct)	116	69.5
	3 times	39	23.4
	≥4 times	7	4.2
	0 times	5	3.0

Regarding IYCF practices, only 30.7% of mothers correctly initiated breastfeeding within the first hour, however, 89.6 % of mothers didn't offer any pre-lacteal feed and 76% of mothers fed their babies with colostrum. However, only 30.4% of the mothers initiated complementary feeding at 6 months, while 36.9% started early. The majority (62.5 %) among the mothers of over 6 months old children reported that they practised exclusive

breastfeeding till 6 months of age while 92.3 % of mothers followed hand washing before feeding the child. It was observed that among the 44 participants, only 45.5% had reported doing exclusive breastfeeding for infants under 6 months of age; while regarding the current practice of breastfeeding in 6 months to 2-year age group, among 140 mothers, 87% reported that they were continuing breastfeeding as per recommendation. In the study, it was found that for children aged 6-9 months, the majority of caregivers (80.8%) correctly practised giving meals at recommended frequency (2 to 3 times or more), for children aged 9-12 months, the majority (79.1%) provided meals at correct frequency, among children aged 1 to 2 years, the majority (68.3%) of children received 3 to 4 meals per day, which is considered correct and regarding children aged 2 to 5 years, the majority (76%) received meals at recommended frequency. Regarding snacks, most of the participants provided snacks to their children at more than the minimum recommended frequency (Table 2).

Table 3: Quantity of food given to children of different age groups (n=307, 6 months to 5 years).

Variables (practice related)		Frequency (N)	Percentage (%)
Quantity of food given for 6 to 9 months old child per serve (n=26)	at least 1/2 katori/cup (correct)	24	92.3
	at least 3/4 katori/cup	2	7.7
Quantity of food given for 9 to 12 months old child per serve (n=19)	at least 1/2 katori (correct)	17	89.5
	at least 3/4 katori/cup	2	10.5
Quantity of food given for 1 to 2 year old children per serve (n=95)	at least 3/4 katori/cup (correct)	21	22.1
	at least 1 full katori/cup	6	6.3
	at least 1/2 katori/cup	68	71.6
Minimum quantity of food given for 2 to 5 year old child (n=167)	at least 1 full katori (correct)	21	12.6
	at least 1/2 katori	113	67.7
	at least 3/4 katori	33	19.8

Table 4: Determinants of IYCF knowledge of mothers (n=351): bivariate analyses.

Variables		IYCF knowledge		Test of significance	Odds ratio (95% CI)
		Good N (%)	Poor N (%)		
Mother's age (years)	>25	64 (39.0)	100 (61.0)	χ^2=3.200; df=1; p=0.074	1.497 (0.961-2.332)
	≤25	56 (29.9)	131 (70.1)		
Religion	Hindu	19 (35.8)	34 (64.2)	χ^2=0.077; df=1; p=0.782	1.090 (0.498-1.689)
	Muslim	101 (33.9)	197 (66.1)		
Family type	Nuclear	81 (34.8)	152 (65.2)	χ^2=0.102; df=1; p=0.749	1.079 (0.657-1.725)
	Joint	39 (33.1)	79 (66.9)		
Caste	General	42 (36.5)	73 (63.5)	χ^2=0.414; df=1; p=0.520	1.165 (0.731-1.858)
	SC/ST/OBC	78 (33.1)	158 (66.9)		
Education of mother	UG/PG	24 (49.0)	25 (51.0)	χ^2=5.538; df=1; p=0.019	2.060 (1.119-3.792)
	Illiterate/ primary/ secondary/HS	96 (31.8)	206 (68.2)		
SES	Upper-middle/ middle class	92 (34.3)	176 (65.7)	χ^2=0.010; df=1; p=0.921	1.027 (0.610-1.727)
	Lower class	28 (33.7)	55 (66.3)		

It was found that for children aged 6-9 months, and 9-12 months, all the respondents offered adequate or more than the recommended amount of food per meal. Among children aged 1-2 years, a significant proportion (71.6%) received 1/2 katori/cup of food per serving, which is less than the recommended minimum and for children aged 2-5 years, the majority (87.4%) received less than the recommended amount per serve (Table 3).

Regarding quality or diversity of food, only 12% of the children received food from all 3 recommended groups (carbohydrate, protein, fruits and vegetables). Only 16% received added oil in the form of ghee/butter.

In the study, participants' knowledge scores were assessed and it was found that 29% of participants scored below average, with scores ranging from 0 to 4.

The majority, 49.3% had an average knowledge score in the range of 5 to 10. Additionally, 21.7% scored above average, with scores ranging from 11 to 16. Regarding participants' practice scores, it was found that 9% of participants scored below average, with scores ranging from 0 to 2. The majority, (74.5%) had an average practice score in the range of 3 to 5. Additionally, 16.5% scored above average, with scores ranging from 5 to 7.

Table 5: Determinants of IYCF practice of mothers (n=351): bivariate analyses.

Variables		IYCF practice		Test of significance	OR (95%CI)
		Good N (%)	Poor N (%)		
Mother's age (years)	>25	68 (41.5)	96 (58.5)	χ^2=0.062; df=1; p=0.803	0.947 (0.620-1.449)
	≤25	80 (42.8)	107 (57.2)		
Family type	Nuclear	96 (41.2)	137 (58.8)	χ^2=0.264; df=1; p=0.607	0.889 (0.569-1.391)
	joint	52 (44.1)	66 (55.9)		
Religion	Hindu	21 (39.6)	32 (60.4)	χ^2=0.165; df=1; p=0.684	0.884 (0.847-1.604)
	Muslim	127 (42.6)	171 (57.4)		
Caste	General	45 (39.1)	70 (60.9)	χ^2=0.646; df=1; p=0.422	0.830 (0.527-1.308)
	SC/ST/OBC	103 (43.6)	133 (56.4)		
Education of mother	Gradation and above	18 (36.7)	31 (63.3)	χ^2=0.689; df=1; p=0.407	0.768 (0.412-1.434)
	Illiterate/ primary/ secondary	130 (43.0)	172 (57.0)		
SES	Upper-middle/ middle class	111 (41.4)	157 (58.6)	χ^2=0.260; df=1; p=0.610	0.879 (0.535-1.444)
	lower class	37 (44.6)	46 (55.4)		
No. of living issue of mother	1	59 (42.1)	81 (57.9)	χ^2=0.000; df=1; p=0.994	0.998 (0.648-1.539)
	>1	89 (42.2)	122 (57.8)		
Birth order of indexed child	1	58 (42.0)	80 (58.0)	χ^2=0.002; df=1; p=0.967	0.991 (.642-1.529)
	>1	90 (42.3)	123 (57.7)		
Childs age in completed months	24-59	69 (41.1)	99 (58.9)	χ^2=0.158; df=1; p=0.691	0.918 (0.600-1.402)
	0-24	79 (43.2)	104 (56.8)		
Childs gender	Male	72 (41.9)	100 (58.1)	χ^2=0.013; df=1; p=0.910	0.976 (0.639-1.491)
	Female	76 (42.5)	103 (57.5)		
Place of birth	Hospital/ nursinghome	145 (42.3)	198 (57.7)	χ^2=0.634; df=1; p=0.426	0.488 (0.081-2.959)
	Home/in transit delivery	3 (60.0)	2 (40.0)		
ASHA's home visit within one month	Yes	38 (52.8)	34 (47.2)	χ2=4.183; df=1; p=0.041	1.717 (1.020 - 2.892)
	No	110 (39.4)	169 (60.6)		

Bivariate analyses revealed that the mothers having educational levels more than higher secondary have higher odds of good IYCF knowledge (Table 4).

Bivariate analyses revealed that the mothers who had experienced "ASHA's home visit within one month" had higher odds of good IYCF practice (Table 5).

DISCUSSION

The current study underscored a huge gap in knowledge among mothers regarding age-appropriate feeding of children. A study in selected areas of Dadra et al revealed that 24.50% of the participants demonstrated inadequate knowledge, while 64.50% possessed moderate knowledge, leaving only 11.0% with adequate knowledge on the subject matter.[13] Similar findings had also been reported in a study by Chetan et al and Chand et al. In different studies.[14,15] Bivariate analyses in the current study revealed that mothers having educational levels more than higher secondary have higher odds of good IYCF knowledge. Though a study by Das et al did not find a relationship between the literacy status of mothers and IYCF perception, it revealed that perception scores among younger than 20-year-old mothers were highest.[16]

The current study surprisingly revealed that though the knowledge was poor, most of the mothers were feeding their children in the correct frequency, though not in the right amount and diversity. This depicted that continuous malpractice in feeding might not reflect in a child's health instantly but can do so in future. In a study of 2017, within the tribal population of a tea estate in Darjeeling District, West Bengal, India, it was reported a notable proportion (9.5%) initiating solid foods before the recommended age of six months. Moreover, a significant majority (90.5%) introduced complementary feeds after six months, indicating a widespread deviation from optimal feeding

timelines. Nonetheless, the study noted that only 44% of the population exhibited age-appropriate feeding practices, suggesting room for improvement in promoting optimal feeding behaviours. In the current study, only 16.5% of mothers had above-average practice scores underscoring the importance of targeted interventions to ensure adherence to recommended feeding guidelines, thereby enhancing the nutritional well-being of infants.[17] Bivariate analyses in the present study revealed that the mothers who had experienced "ASHA's home visit within one month" had higher odds of good IYCF practice, though it did not find any relationship of feeding practices with age, or literacy level of the mother. However, literacy status was found to be associated with feeding practices in previous researches.[16,18]

The researches in IYCF domain were predominantly conducted in relation to WHO indicators. The current study was a unique one to address the issue as per indigenous HBYC guidelines which were easier for comprehension as per mother's perspective. Concept of Katori feeding can guide a mother about correct amount of age-appropriate feeding. Similar importance should be given on dietary diversity to combat different micronutrient deficiency. The current study underscored severe deficiency in correct knowledge as well as the gap in activities of ASHA in this regard. Only 16.5% of mothers were having an above average score of practice related to IYCF. This faulty feeding practice can halter the growth of the child in future.

The study might have been challenged by some major limitations like practices assessed were only stated or self-reported which might not reflect the actual practice. Also, it was done in a rural area of West Bengal, hence might not reflect the picture of the urban area.

CONCLUSION

It was evident that there were significant challenges in terms of maternal knowledge about IYCF, age-appropriate feeding practices. The study revealed an important gap in the implementation of government initiatives to improve the complementary feeding status of under-five children. The counselling of Katori feeding, which had been introduced under the HBYC guideline, was not adequately and regularly conducted by ASHA, as found in the study. Hence, the desired outcomes have not been achieved yet, indicating a gap in the health system. It was important to improve the coordination and implementation of existing programs run by the government and interventions to bridge these gaps and achieve better outcomes for child nutrition and health.

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