RESULTS

The relation between malnutrition and other factors was studied .

Table (1) Weight for age classification of the studied infants according to nutritional status.

Weight/age classification	No	%
Normal	411	41.1
Malnutrition	589	58.9
- Overweight	157	15.7
- Undernutrition	432	43.2
Total	1000	100.00

This table and figure (1) show that 411 infants were noraml as regard weight for age and 589 were malnourished. The percentage of malnutrition was 58.9% among the studied infants, distributed as 15.7% overweight and 43.2% as undernutrition.

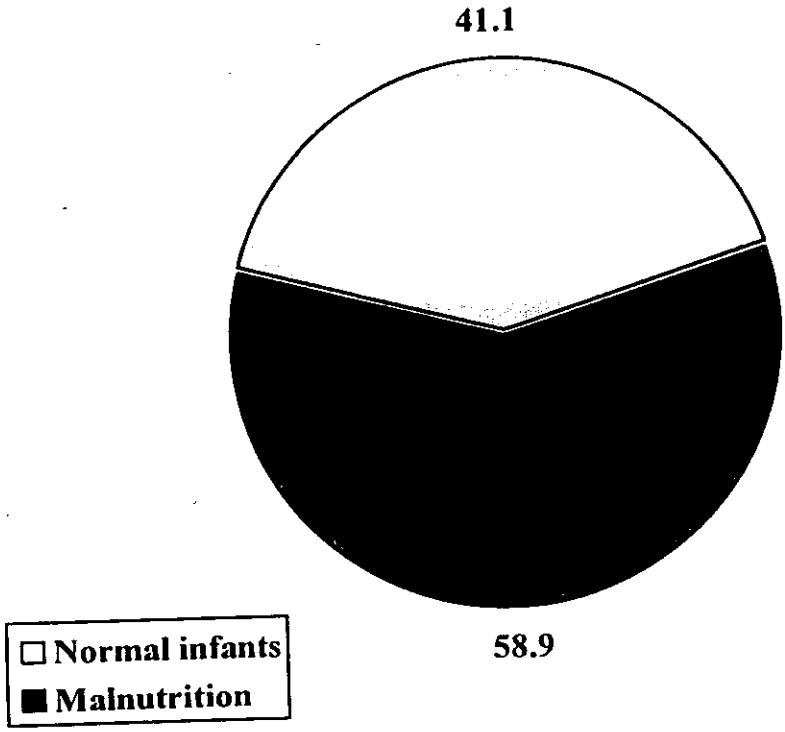


Fig. (1) Pie chart shows distribution of the studied sample according to nutritional status .

Table (2) Distribution of the studied group according to residence and nutritional status .

Nutritional status / Residence	Normal		Malnutrition		Total	
	No	%	No	%	No	%
Benha	111	42.7	149	57.3	260	26.0
Tokh	96	42.1	132	57.9	228	22.8
Kafer shoker	105	41.2	150	58.8	255	25.5
Sheblunga	99	38.5	158	61.5	257	25.7
Total	411	41.1	589	58.9	1000	100.00

$X^2 = 1.07$
$P > 0.05$

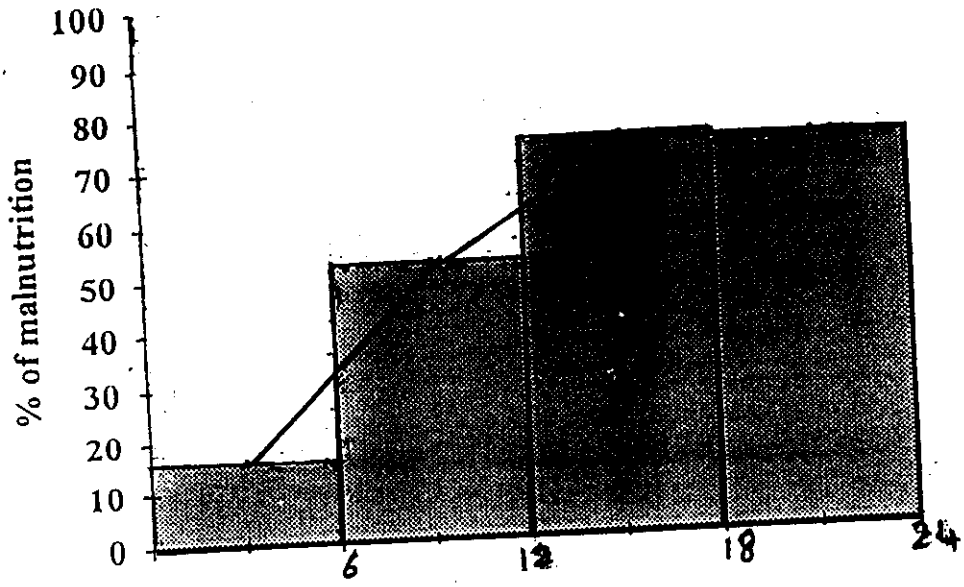
This table shows that malnutrition among infants in Benha is less than Tokh, kafarshokr and Sheblunge . It represents 57.3% , 57.9% 58.8% and 61.5% respepctively . The difference is insignificant Statistically (P> 0.05).

Table (3) Distribution of the studied group according to age and nutritional status .

Nutritional status age in months	Normal No	Normal %	Malnutrition No	Malnutrition %	Total No	Total %
< 6	97	84.3	18	1.7	115	11.5
6 -	183	47.7	201	52.3	384	38.4
12	51	25.4	150	74.6	201	20.1
18 - 24	80	26.7	220	73.3	300	30.0
Total	411	41.1	589	58.9	1000	100.00

X^2= 142
P< 0.05

The above table illustrated by Figure (2) shows that malnutritio is more common in the second year (about 74%) than over 6 months (about 52%). The difference is significant statistically ($p<0.05$).



Infant age in months

Fig. (2) Age and malnutrition

Table (4) Distribution of the studied group according to sex and nutritional status .

Nutritional status sex	Normal No	%	Malnutition No	%	Total No	%
Male	253	39.8	383	60.2	636	63.6
Female	158	43.4	206	56.6	364	36.4
Total	411	41.1	589	58.9	1000	100.00

$X^2 = 1.3$
$P > 0.05$

This table and Figure (3) show that the male to female ratio is the sample was 1.7.Also, shows, malnutrition was more commne among male: (60.2%) than females (56.6%) but the difference is statistically insignificant (P>0.05) .

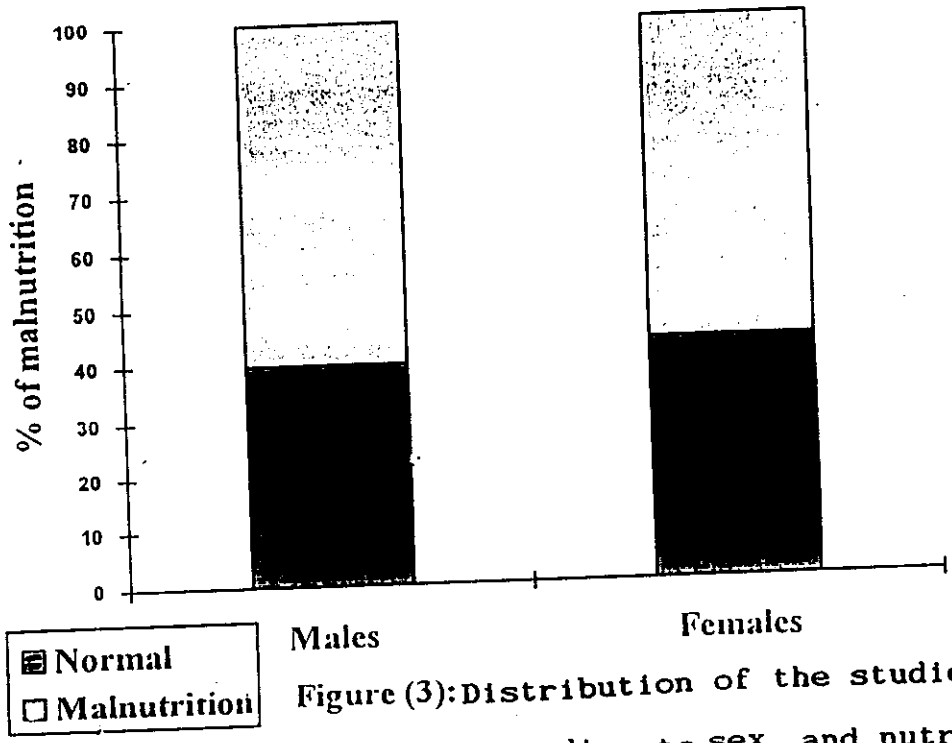


Figure (3): Distribution of the studied group according to sex and nutritional status.

Table (5) Distribution of the studied group according to order of birth and malnutrition .

Nutritional status order of birth	Normal No	%	Malnutition No	%	Total No	%
The first baby	100	62.9	59	37.1	159	15.9
The second baby	160	54.8	132	45.2	292	29.2
The third baby	80	30.0	187	70.0	267	26.7
The fourth baby and more	71	25.2	211	74.8	282	28.0
Total	411	41.1	589	58.9	1000	100.00

$X^2 = 97$
$P < 0.05$

This tabe and Figure(4) show that the first infant is the least child suffering from malnurtition (37.1%) and with higher birth order the risk of exposure increased. About three fourths (74.8) of the fourth orderand more was exposed to malnutrition. The difference is satistically significant (P<0.05)

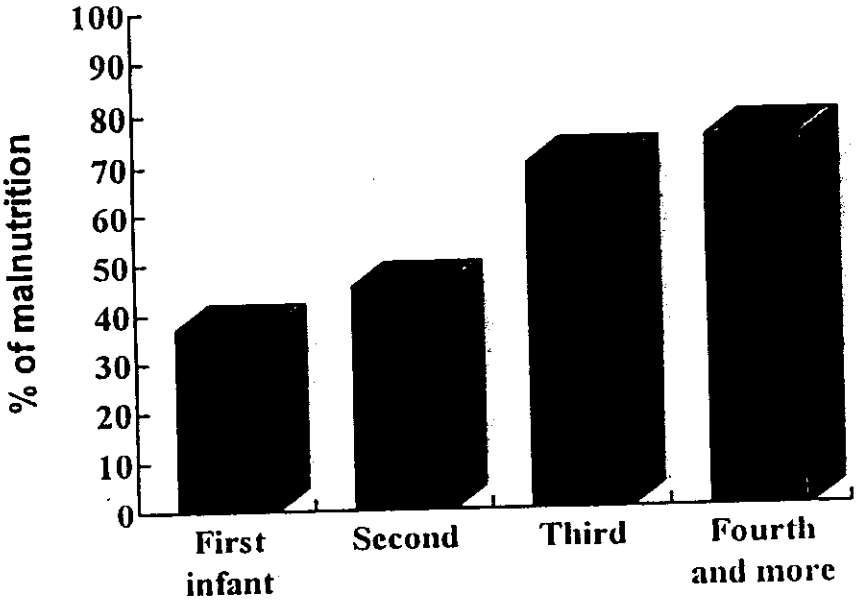


Fig.(4) Order of birth and malnutrition

Table (6) Distribution of the studied group according to mother's age and nutritional status.

Nutritional status mother's age (years)	Normal No	%	Malnutition No	%	Total No	%
16 -	42	20.8	160	79.2	202	20.2
20 -	99	33.2	199	66.8	298	29.8
24 -	71	41.3	101	58.7	172	17.2
28 -	51	58.0	37	42.0	88	8.8
32 -	81	61.8	50	38.2	131	13.1
36 - 40	67	61.5	42	38.5	109	10.9
Total	411	41.1	589	58.9	1000	100.00

$X^2 = 94.3$
$P < 0.05$
$R = - 0.15253$

This table shows the distridution of the studied group according to mother's age and nutritional status , where the most frequant malnourished infants were more belonging to mothers aged between 16 - 20 years . The mean age of the studied mothers was 26.26 with ± 16.5 S.D. Also, malnutrition steadly declined with increasing mother's age . Non of the investigated mothers were above 40 years old . The difference is statistically significant. Also, there is nagative correlation (R=-0.15253) between mother's age and nutritional status of the infants.

Table (7) Distribution of the studied group according to the * socioeconomic status and nutritional status.

Nutritional status socioeconomic status	Normal No	%	Malnutition No	%	Total No	%
Lower class	184	20.2	468	77.8	652	65.2
Middle class	150	58.8	105	41.2	255	25.5
Upper class	77	82.8	16	17.2	93	9.3
Total	411	41.1	589	58.9	1000	100.00

$X^2 = 144.6$
$P < 0.05$

* The socioeconimic status was classified into three classes according to the socioeconimic index . (Shoulah, 1988) .

This table illustrates that 65.2% of the sample was of lower socioeconimic class infants and malnutrition was more common in that class (71.8%) than the middle (41.2%) and upper (17.2%) ones.

The difference is statistically significant ($P<0.05$).

Table (8)Distribution of the studied group according to level of mother' education and thenutritional status .

Nutritional status Mothers education	Normal No	Normal %	Malnutrition No	Malnutrition %	Total No	Total %
Illitrate	167	29.5	421	70.5	597	59.7
Read & Write	48	48.0	52	52.0	100	10.0
Basic education	30	51.7	28	48.3	58	5.8
Secondary or technical	129	61.1	82	38.9	211	21.1
University	28	82.4	6	16.6	34	3.4
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 96.9$
$P<0.05$
$R = -0.18261$

This table and Figure (5) show that malnutrition was more common among infants of illitrate mother's (70.5%) than those of hightly educated ones (17.6%) . The difference is statistically significant (P<0.05) . Also , there is negative correlation (R = - 0.18261) between the level of mother's education and nutritional status of the infant .

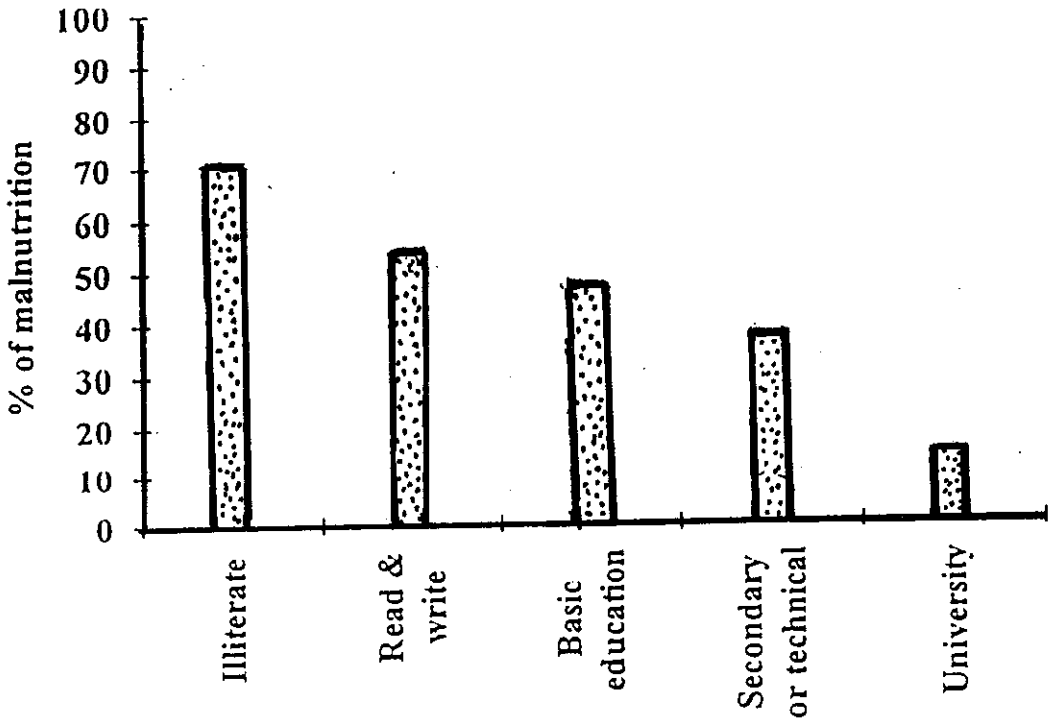


Fig. (5) Education of mother and malnutrition

Table (9) Distribution of the studied group according to type of feeding and the nutrition status .

Nutritional status Mothers education	Normal No	%	Malnutrition No	%	Total No	%
Breast	179	34.8	335	65.2	514	51.4
Artificial	81	40.9	117	59.1	198	19.8
Mixed feeding	151	52.4	137	47.6	288	28.8
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 23.6$
$P < 0.05$

This table shows that malnutrion is more common among breast fed infants (65.2%) than bottle fed ones (59.1%) and the mixed fed ones (47.6%) . The difference is statistically significant ($P < 0.05$)

Table (10) Distribution of the studied group according to colostrun feeding and the nutritional status

Nutritional status Colostrum feeding	Normal No	%	Malnutrition No	%	Total No	%
Yes	348	75.2	115	24.8	463	46.3
No	63	11.7	474	88.3	537	53.7
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 161$
$P < 0.05$

This table shows that malnutrion is more common among infants who did not fed on colostrum in the first few days of life (88.3%) while the percent of who fed was 24.8% . The difference is statistically significant ($P < 0.05$).

Table (11): Distribution of malnutrition Cases according to causes of cessation of breast feeding .

Causes of cessation	No.	%
Maternal Causes as		
- another pregnancy	165	34.0
- scanty of breast milk	117	24.1
- working mothers	110	22.6
- More than one cause	75	15.4
- Maternal disease	60	12.3
Infant Causes as :		
- refusal of breast, illness, congenital anomalies (harelip or cleft palate)	34	7.0

This table shows that a following pregnancy is the commonest cause (34.0%) for cessation of breast feeding followed by other maternal causes, while the least related to infant (7.0%).

Table (12) Distributionof the studied group according to duration of milk feeding and thenutritionalstatus .

Nutritional status Duration in months	Normal No	%	Malnutrition No	%	Total No	%
< 8	62	31.2	137	68.8	199	19.9
8 -	226	35.8	405	64.2	631	63.1
16 - 24	123	72.4	47	27.6	170	17.0
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 83.9$
$P < 0.05$

This table shows that malnutrition as less , common among infants who fed milk 16 - 24 months (27.6%) than among those who fed it for less than 16 months (64.2% - 68.8%) . The difference is statistically signficant (P < 0.05) .

Table (13)Distribution of the studied group according to the sufficiency of milk andnutritionalstatus .

Nutritional status Duration in months	Normal No	%	Malnutrition No	%	Total No	%
Sufficient	288	49.1	298	50.9	586	58.6
Insufficient	123	29.7	291	70.3	414	41.4
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 37.9$
$P < 0.05$

This table shows thatmalnutrition wasless , common when the quantity of breast milk for each meal was sufficient and statisfying the infantneeds (50.9%) and more common when it was insufficient (70.3%) the difference is statistically ($P < 0.05$) significant.

Table (14)Distribution of the studied group according to types of food given at night andnutritionalstatus .

Nutritional status / Food given at night	Normal No	Normal %	Malnutrition No	Malnutrition %	Total No	Total %
Lactagogues *	153	31.4	334	68.6	487	48.7
Milk	220	78.9	59	21.1	279	27.9
Nothing	38	16.2	196	83.8	234	23.4
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 242.9$
$P < 0.05$

* Lactagogues are sugar soups and herbal remedies

This table shows that malnutrition was less common among babies who were fed milk by night (21.1%) than those nothing (83.8%) those who fed lacagogues were in between (68.6%) . The difference is the statistically significat ($P < 0.05$) .

Table (15): Distribution of the studied group according to mother's belief toward types of food affecting flow of breas mill

Type of food	No.	%
Food increasing milk:		
- Good (Protein) diet	323	32.3
- Helba	305	30.5
- Halawa tehnia	202	20.2
- Do not know	170	17.0
- more than one	158	15.8
Food decreasing milk:		
- Molokhia	397	39.7
- Do not know	393	39.3
- Contraceptive pills	148	14.8
- Fish	62	6.2

This table shows that mothers believed good diet e.g, chees milk products (32.3%), Helba (30.5%), Halawa tehnia (20.2%) Would increase milk flow, while, Molokhia (39.7%), pills (14.8%) and Fis (6.2%) would decrease it .

Table (16) Distribution of the studied group according to time of beginin weaning andnutritionalstatus .

Nutritional status * time of weaning	Normal No	%	Malnutrition No	%	Total No	%
Early weaning(<4ms)**	80	85.1	14	14.9	94	9.4
Acceplable weaning (4 - 6 ms)	258	63.5	148	36.5	406	40.6
Delayed weaning (>6ms)	73	14.6	427	85.4	500	50.0
Total	411	41.1	589	58.9	1000	100.0

X^2= 304.7
P < 0.05

* The classification is according to WHO (1986) .

** As all those below 4 months sometimes fed on syrups or juices.

This table illustrates that malnutrition was more common with delayed weaning time (85.4%) than with early weaning (14.9%) . Acceptable weaning (4 - 6 ms) accompanying malnutrition among 36.5% of the studied infants .

The difference is statistically sign ificant (P< 0.05)

Table (17) Distribution of the studied group according to the supplementary foods of weaning andnutritionalstatus .

Nutritional status supplementary food	Normal No	%	Malnutrition No	%	Total No	%
Mainly carbohydrate	204	32.4	427	67.6	631	63.1
Mainaly proteins	207	56.1	162	43.9	369	36.9
Total	411	41.1	589	58.9	1000	100.0

$X^2 = 105.2$
$P < 0.05$

This table shows that malnutirtion was more common when the infants were given more carbohydrates during weaning (63.1%) versus (63.9%) when given more protein .The difference is statistically significant .

Table (18) Relationship between mother's care of infant food and nutritional status (according to WHO , 1986) .

Nutritional status infant food	Normal No	%	Malnutrition No	%	Total No	%
* Specially prepared food	330	54,0	281	46.0	611	61.1
Family food in a separate plate	65	21.0	244	79.0	309	30.9
Family food in communal dish	16	20.0	64	80.0	80	8.0
TOtal	411	41.1	589	58.9	1000	100.0

X^2= 113.13
P < 0.05

* This group includes , also infants who have not been weanned .

This table shows that malnutrition was more common when the infants shared family in a communal dish (80.0%) than among those fed family foods in a separate plate (79.0%) .

The least frequency was among infants fed especially prepared food (46.0%) . The difference is statistically significat (P < 0.05) .

Table (19) Relationship between history of diarrhea and nutritional status among the studied group.

Nutritional status / History of diarrhea	Normal No	Normal %	Malnutrition No	Malnutrition %	Total No	Total %
History of recurrent* diarrhea	113	38.3	287	71.1	400	40.0
No history or history of unrecurrent	298	49.7	302	50.3	600	60.0
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 46.92$
$P < 0.05$

* Recurrent diarrhea means more than twice per month (WHO , 1984).

This table illustrates that malnutrition is more common among infants with history of recurrent diarrhea (71.3%) than those without history (50.3%) . This difference is statistically significant ($P < 0.05$) .

Table (20) Relationship between maternal beliefs toward the cause of the disease andnutritionalstatus of the studied group.

Nutritional status / Maternal belief	Normal		Malnutrition		Total	
	No	%	No	%	No	%
True belief	302	63.05	177	36.95	479	47.9
False belief	109	20.9	412	79.1	521	52.1
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 153.8$
$P < 0.05$

This table shows that malnutrition was less common among infants of mothers who attributed the cause of disease to an agent (36.95%) than among whose mothers attributed it to false belifes as evil eye, spirit or magic (79.1%) . The difference is statistically significant (P< 0.05) .

Table (21) Relationship between the onset of medical treatment of diseased infants and nutritional status .

Nutritional status onset of medical treatment	Normal No	%	Malnutrition No	%	Total No	%
Early (at first day of disease)	240	47.2	269	52.8	509	50.9
Late (later on)	171	34.8	320	65.2	491	49.1
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 15.7$
$P < 0.05$

This table shows that malnutrition was more common when the mothers go to physician for treatment of ill infants in late stages (65.2%) than when they go in early stage (52.8%) at the first 24 hours . The difference is statistically significant (P< 0.05) .

Table (22) Relationship between the adopted type of treatment during the disease and nutrition status of the studied group.

Nutritional status type of treatment	Normal		Malnutrition		Total	
	No	%	No	%	No	%
Medical treatment	345	60.0	230	40.0	575	57.5
Traditional treatment*	66	15.5	359	84.5	425	42.5
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 183.8$
$P < 0.05$
* WHO (1979)

This table illustrates that malnutrition was less common among infants whose mothers adopted medical treatment (40%) than among those practicing traditional treatment (84.5%) .

The difference is statistically significant (P< 0.05) .

Table (23) Relationship between pattren of feeding during diarrhea and nutritional status of the studied group.

Nutritional status pattern of feeding	Normal No	%	Malnutrition No	%	Total No	%
Stop feeding	12	11.8	90	88.2	102	10.2
Rice weter and starch	52	17.32	248	82.7	300	30.0
The usual feeding	20	28.2	51	71.8	71	7.1
Milk only	78	50.0	78	50.0	156	15.6
Milk and ORS	249	67.1	122	32.9	371	37.1
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 220.2$
$P < 0.05$

This table shows that malnutrition was more common when the infants were deprived from feeding during diarrhea (88.2%) and less common when they were given milk and oral rehydration solution (ORS) (32.9%) .

The difference is statistically significat (P<0.05)

Table (25) Distribution of the studied group according to maternal hygiene and nutritional status of the studied group.

Nutritional status maternal hygiene	Normal No	%	Malnutrition No	%	Total No	%
Unhygienic practice	31	11.9	230	88.1	261	26.1
Partial hygienic	178	35.0	330	65.0	508	50.8
Fullhygienic practice	202	87.4	29	12.6	231	23.1
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 304.7$
$P < 0.05$

This table clearly shows that malnutrition was more common among infants whose mothers did not follow hygienic measures during food preparation (88.1%) while the percent of those who followed hygienic measures amounted to 12.6% .

The difference is statistically significant (P<0.05).

Table (26) Distribution of the studied group according to the source of nutritional education and nutritional status of their infants.

Nutritional status sourc of nutritional education	Normal No	%	Malnutrition No	%	Total No	%
Adequate maternal knowledge	111	64.9	60	35.1	171	17.1
Inadequate maternal knowledge	300	36.2	529	63.2	829	82.9
TOtal	411	41.1	589	58.9	1000	100.0

$X^2 = 63.5$
$P < 0.05$

This table clearly shows that malnutrition was more common among infants whose mothers received inadequate nutritional knowledge (63.8) than those whose mothers received adequate knowledge (35,1%) .

The difference is statistically significant (P<0.05)

Table (27): Classification of the studied group according to signs of malnutrition .

Signs of malnutriton	No.	%
No Signs	411	41.1
PEM	299	29.9
Anaemia	111	11.1
Multiple deficiency	186	18.6
Rickets	22	2.2
overweight	157	15.7
Total	1186	118.6 *

* Total exceeds 100% because there were 186 cases had multiple deficiencies .

This table shows that PEM is the commonest clinical form of malnutrition (29.9%) among the studied group while rickets is the least common (2.2%) .

Table (28): Classification of anaemic infants according to Tallquvist technique and WHO classification (1986).

	No.	%
No anaemia	703	70.3
Border line anaemia	199	19.9
Frank anaemia	98	9.8
Total	1000	100.0

This table shows that 70.3% of the studied infants were inanaemic. The rest 29.7% were anaemic, 19.9% border line anaemia and 9.8% frank anaemia.

Table (29) Simple regression analysis of the sociobiological factors and nutritional status.

Independent Vriables	Mean $\bar{X}$	Standard deviation ± SD	Correlation Co-efficient R	regression Coefficient B	Computed T	Probability P
Age of the infant	12.975	6.2372	0.21941	0.0210	5.844	0.00000
Type of feeding	1.8080	0.8888	0.8779	0.0997	3.0997	0.00011
Mother's age	26.255	6.5088	-0.15253	-0.0111	-3.123	0.00184
Mothers education	1.960	1.3244	-0.18261	-0.0722	-4.136	0.00004
Socioeconomic status	20.116	2.4053	-0.23960	-0.0111	-5.922	0.00000

This table shows that the separate effect of each individual factor, papy age , type of feeding, mother's age, mother's education and the socioeconomic status, had asignificant effect on the nutrition status and the simple regression coefficient, (B) of these variables were significant ($P< 0.05$) . .

Table (30) Stepwise multiple regression analysis of nutritional stauts as dependent variable and the sociobiological factors as independent variable

Independent Vriables	Mean $\bar{X}$	Standard deviation $\pm$ SD	Partial reg. Coefficient B	Computed coeff. t	Probability P
Age of infant	12.975	6.2372	0.0210	5.844	0.00000
Mother's age	26.255	6.5088	-0.0111	-3.123	0.00184
Socioeconomic stauts.	20.255	12.4053	-0.0111	-5.922	0.00000
Mother's education	1.9606	1.3244	-0.0722	-4.136	0.00004
Type of feeding	1.8080	0.8888	0.0997	3.894	0.00011

This table shows that the collective effect of the five sociobiological (independent) variables on the nutritional status gave the higher coefficient of determination (R^2 = 0.1317).

Table (31) Simple regession analysis of factors related to knowledge attitude and practice of feeding and history of recurrent diarrhea and nutr. stat.

Independent Vriables	Mean $\bar{X}$	Standard deviation $\pm$ SD	Correlation Co-efficient R	Partial reg Coefficient B	Computed coeff. t	Probability P
Type of feeding	1.774	0.867	-0.2291	0.125953	4.856	0.0000
Food give at night	2.045	0.715	-0.3663	-0.32156	-1.0135	0.0000
Food given during dia.	3.076	1.073	-0.4619	0.37313	1.815	0.0099
Source ofn-ut.knowledge	2.292	0.741	-0.4642	0.42081	1.413	0.1580
History of recurrent diarrhea	1.601	0.490	0.4840	-0.174115	-3.839	0.0001

This table shows that the separate effect of each individual variable on the nutritional statuts where the type of food given at night , food given during diarrhea , history of recurrent diarrhea anc type of feeding had significant effect on nutritional status ($P<0.05$), while source of nutritional knowledge had insignificant effect ($P>0.05$) as determined by the simple regreression coefficeint (B) .

Table (32) Stepwise multiple regression analysis of type of feeding , type of food, given at night and history of recurrent dirrhea as independent variables and nutritional status as depentent .

Independent Vriables	Mean $\bar{X}$	Standard deviation $\pm$ SD	Partial reg Coefficient B	Computed coeff. t	Probability P
Type of feeding	1.774	0.867	0.12795	4.8565	0.0000
Type of food given at night	2.045	0.715	-0.32432	-10.1348	0.0000
History of recurrent diarrhea	1.601	0.490	-0.17516	-3.8394	0.0001

This table shows that the combination which gave the higher coefficient of determination (R^2) were type of feeding, type of food given at night and History of recurrent diarrhea. The coefficient of determination (R^2) was 0.1254.