Original Article

Determinants of subjective health status of HIV positive mothers in NAUTH Nnewi

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ABSTRACT

BACKGROUND: Acquired immune deficiency syndrome (AIDS) caused by human immune deficiency virus (HIV), once dominated by infected males has become feminized especially in sub-Saharan Africa where the majority of adults living with the condition are females. Positive life styles, belonging to social support groups and stigma-free HIV services by providers may have good impact on the quality of life of HIV-positive mothers.

This study was aimed at assessing the determinants of subjective health status of HIV-positive mothers accessing prevention-of-mother-to-child-transmission (PMTCT) of HIV services in Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi.

METHODS: This is a descriptive study in which 288 consenting HIV positive mothers were selected using the systematic sampling technique. Data on demographics, life style, social support, contraceptive use and subjective feeling about current health status were collected from the subjects using a pre-tested, structured, interviewer-administered questionnaire.

RESULTS: The mean age of the respondents was $30.46^{\pm}4.86$ years. Majority (89.2%) of them were married while 55.2% were traders. A significantly higher proportion of the mothers on highly active anti retroviral therapy (HAART) (70.8%) than non users (29.2%) described their current health status as 'excellent' ($p<0.001$). Also a significantly higher proportion of condom users (99%) than pill users (1%) described their health status as 'excellent' ($p<0.02$). The same significantly higher proportions of 'excellent' response were given by subjects who engage in social support activities ($p<0.001$), who practice good feeding ($p<0.01$) and personal hygiene ($p<0.01$).

CONCLUSION: Access to family planning services and HAART, participation in support group activities and positive lifestyle practices tend to improve subjective health status and should be comprehensively encouraged among the HIV positive mothers.

KEY WORDS: Determinants, health status, HIV positive mothers.

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INTRODUCTION

Acquired immune deficiency syndrome (AIDS) is a disease condition caused by infection of the human body by a retrovirus called the human immune deficiency virus (HIV) [1] which destroys the body's CD_4 cells. Depletion of the CD_4 cells leads to immune deficiency state and an increased likelihood of the body's being invasion by opportunistic organisms. These organisms, which are ordinarily harmless to the human body, then become pathogenic and cause opportunistic infections [2]. It is the opportunistic infections that reduce the quality of life of the individual and eventually result in death if treatment is not promptly and adequately provided. Highly Active Anti-retroviral Therapy (HAART), when promptly and adequately provided and taken, reduces HIV morbidity and mortality [3,4].

Over the decades, the epidemic, once dominated by infected males has become feminized and in sub-Saharan Africa approximately 60% of adults living with the HIV are women [5,6,7]. In the absence of interventions, between 15% and 45% of infants born to HIV-infected mothers acquire the infection during pregnancy, delivery or through breast-feeding [8]. The burden of mother to child transmission (MTCT) of HIV is higher in sub- Saharan Africa than the rest of the world, because of higher levels of hetero-sexual transmission, high female to male ratio, high total fertility rate (TFR) and high rate of breast-feeding [9,10].

The responsibility of the government and health services is to ensure that HIV positive women and their partners have real choices of action, and to respect and support the decisions they reach [11]. This means: providing good quality, user-friendly, and easily accessible family planning services so that HIV positive women can avoid pregnancy if they choose, promoting condom use, either alone or combined with a more effective method of contraception (dual method) for dual protection from HIV and other sexually transmitted infections (STIs) and from unplanned pregnancies as an effective strategy to prevent HIV transmission, integrating dual protection messages into family planning counseling services and offering contraception to replace the birth spacing effect of exclusive breastfeeding in women who chose replacement feeding because of their HIV status. Appropriate family planning methods are discussed during antenatal period and again before discharge home after delivery. In this part of the world where prolonged exclusive breastfeeding is the norm, some women may rely on lactational amenorrhoea (LAM) as a contraceptive method, and this will be lost with changes in infant feeding methods. Some women may have a

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period of abstinence after the birth of the child, and may not wish to start contraceptive use before this. They are given information about how and where to obtain contraception when they wish.

All HIV positive women are given optimal health care to ensure safe delivery. HIV infected women receiving HAART are allowed to continue therapy, even when pregnancy is discovered. The HIV positive women are not isolated or treated differently from other women in labour. Universal safety precautions are observed by the health workers on all women in labour irrespective of their HIV status. Emotional support during labour is particularly important for an HIV-infected woman who is concerned about her condition and the risk of transmission to the child. This may be made worse by her fear of stigmatization and discrimination by medical staff, or because she has not disclosed her status to her partner or family members.

Subjective health status of an individual is equivalent to subjective well being (SWB) of the person. There are substantial positive associations between health and SWB so that people who rate their general health as "good" or "excellent" tend to experience better SWB compared to those who rate their health as "fair" or "poor". A meta-analysis found that self-ratings of general health were more strongly related to SWB than physician ratings of health.[12] The relationship between health and SWB may be bidirectional. There is evidence that good subjective well-being contributes to better health.[13] A review of longitudinal studies found that measures of baseline subjective well-being constructs such as optimism and positive affect predicted longer-term health status and mortality. Conversely, a number of studies found that baseline depression predicted poorer longer-term health status and mortality. Baseline health may well have a causal influence on subjective well-being so causality is difficult to establish. A number of studies found that positive emotions and optimism had a beneficial impact on cardiovascular health and on immune functioning. Changes in mood are also known to be associated with changes in immune and cardiovascular response.

Wilson and Cleary[14] suggested a model that clarified the relationships between biological and physiological variables, symptoms, function, general health perception, and overall quality of life, and the impact of the characteristics on individuals and their environments. This model indicated that biological and physiological processes affect the perception of symptoms, which in turn affects function, general health perception, and overall quality of life. However, these authors point out that this main causal direction in their model does not imply that there are not reciprocal relationships[14].

Viewed from the bio-psychosocial perspective, subjective health status of HIV positive mothers cannot be explained by biological and physiological factors alone. Instead, subjective health status is the result of an interaction between physiological and psychosocial factors[15]. Therefore, knowledge about what determines subjective health status in this group of patients is relevant for the management of HIV and AIDS, and for the care and rehabilitation of the patients.

To this end, the aim of the present study was to explore the determinants of subjective health status among HIV positive mothers by evaluating the relationship of variables such as use of HAART, life style, contraceptive use, and participation in social support group with the current health status of the HIV positive mothers accessing PMTCT services in Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi.

MATERIALS AND METHODS

The study site is Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, a tertiary health institution owned by the Federal Government of Nigeria. It is located in a commercial nerve centre of Anambra State. The catchment areas span through Anambra State and her neighboring States Imo, Abia, Delta, Enugu, Ebonyi and Kogi States. Anti retroviral services (ARV) services commenced in NAUTH Nnewi in February 2002 under the Federal Government of Nigeria HIV/AIDS response programme. Prevention of Mother to Child Transmission (PMTCT) of HIV is one of the services rendered under the HIV/AIDS programme. Every Monday, approximately 80 mother-child pairs attend the clinic. From Tuesday to Friday, daily mother-child pair attendances average 15, such that an average of 160 mother-child pair attends the clinic every week.

The population consisted of HIV-positive women who received services within PMTCT programme and delivered in the labour ward of NAUTH.

Study design was a cross-sectional descriptive study utilizing data obtained through questionnaires administered on HIV-positive women who participated in the PMTCT programme of NAUTH. The sample size for the study population was determined using the formula for studying proportions with population greater than 10,000 [16] as shown below: $n = Z^2pq/d^2$

Where n = desired sample size

Z = constant = 1.96

p = 25% transmission rate of previous study [17]

q = 1 p = 1 0.25 = 0.75 (effectiveness of intervention) [17]

d = precision using confidence limit of 95% accuracy with 5% margin of error = 0.05

Therefore, n = 1.962 x (0.75 x 0.25)/0.0025 = 288.

The study instrument was structured questionnaire

containing core concepts including demographics, HAART use, contraceptive use, participation in social support group activities, life style, perceived HIV-related stigma and feeling about current health status of subjects. Pre-testing of the questionnaire was done at the NAUTH HIV clinic where 10 HIV positive mothers were selected by systematic sampling technique for this purpose. This was done to identify and modify or simplify ambiguous questions in the questionnaire[18]. Participants in this pretest were excluded from the main study.

Two Research Assistants (RAs) were trained by the Principal Investigator (PI) to administer the questionnaire on the eligible mother-child pair attending the paediatric follow-up clinic. Data collection took place over a period of 4 weeks.

The sampling frame for the questionnaire administration was made up of mothers who attended the HIV follow-up clinic. The starting participant each day was identified using the table of random numbers. Subsequently, alternate names on the list were recruited for the study. The questionnaires were administered by the RAs to the consenting HIV positive mothers until the required sample size of 288 was achieved.

Data was collated, coded, entered and analyzed using the statistical package for social sciences (SPSS) software programme. The values were calculated using Chi-square method for comparison of variables. A p-value of less than 0.05 was considered significant.

ETHICAL CONSIDERATIONS

1. Approval for this study was obtained from the NAUTH Ethical Review Board (ERB)
2. Verbal informed consent was obtained from individual participants

RESULTS

Table 1 shows that the mean age of all the respondents was $30.46^{\pm}4.86$ years. Two hundred and eight (72.2%) of them were aged between 25 and 34 years while 18 (6.2%) were aged over 40 years and above. Two hundred and fifty seven (89.2%) of the respondents were married while 10.8% were single, divorced or widowed. Only 29 (10.1%) had less than secondary education even as 12 (4.2%) had no formal education. The rest, 259 (89.9%) attained at least a secondary level of education. One hundred and fifty four (53.5%) were of Anglican Christian denomination while 3% were Muslim. Traders accounted for 55.2% of the participants, 13.9% were civil servants while 18.4% were unemployed. Eighty three (29.2%) were primiparous while 20 (6.9%) were grand multiparous. Median parity was 2 (range=1-8, mean= $2.42^{\pm}1.38$). There was no significant relationship between the demographics of respondents and their subjective health status.

Table 2 shows that Mothers currently on antiretroviral drugs (HAART) are more likely to describe their health status as 'excellent' (rather than 'fair' or 'good') when compared to those who are not on the drug. Ninety (70.8%) of respondents who are on HAART described their current health status as 'excellent'. This is significantly higher than the 29.2% who gave the same response among those who were not on HAART ($p<0.001$).

Majority (69.1%) of the mothers use condom while 17 (5.9%) use pill. However, 69 (%) are not using any form of contraception (table 3). The table also shows that the subjects are made up of Catholics 153 (%), Anglicans 68 (%), Pentecostals 68 (%) and Muslims 3 (%). Table 4 depicts a significantly higher proportion of contraceptive users (82.4%) than non users (17.6%) who described their health status as 'excellent' ($p<0.05$). Furthermore, in table 5, significantly higher proportion of condom users (99%) than pill users (1%) described their current health status as 'excellent' ($p<0.02$), just as table 6 reveals that mothers who participated in social support group activities verbalized excellent health status (54.3%) as opposed to the 45.7%who did not ($p<0.001$). Furthermore, significantly higher proportion of respondents who practice good nutrition (99.1%) and good hygiene (99.1%) reported 'excellent' health status compared to those who do not practice any of these ($p<0.01$, $p<0.01$) (Table 7).

Table 1: Socio-demographic characteristics of the respondents

	Characteristics	Frequency	Percentages
Age (years)	0-24	30	10.4
	25-29	97	33.7
	30-34	111	38.5
	35-39	32	11.2
	40-44	17	5.9
	45-49	1	0.3
Marital status	Single	4	1.4
	Married	257	89.2
	Divorced	7	6.3
	Seperated	11	3.8
	Widowed	9	3.1
Educational status	No formal education	12	4.2
	Primary	17	5.9
	JSS	68	23.6
	SSS	152	52.8
	Tertiary	39	13.5
Religion	Catholic	154	53.5
	Anglican	62	21.5
	Pentecostal	69	24
	Muslim	3	1
Occupation	Trading	159	55.2
	Civil service	40	13.9
	Artisan	22	7.6
	Teaching	8	2.8
	Student	6	2.1
	Unemployed	53	18.4
Parity	1	8.4	29.2
	2-4	184	63.9
	≥5	20	6.9

Table 2: Mothers current subjective health status according to ARTs intake

Currently on HAART	Subjective well being		
	Good/fair	Excellent	Total
Yes	63	90	153
No	98	37	135
Total	161	127	288

X^2= 28.6 p<0.001*

Table 3: Mothers use of family planning method

	Contraceptive method				
Religion	nothing	condom	Pills	Injectable	Total
Catholic	42	105	4	2	153
Anglican	12	39	10	0	61
Pentecostal	14	51	3	0	68
Moslem	1	2	0	0	3
Total	69	197	17	2	285

Table 4: Mothers subjective health status by contraceptive use

Using contraception	Subjective well being		
	Good/fair (%)	Excellent (%)	Total
No	47 (29.4)	22 (17.6)	69
Yes	113 (70.6)	103 (82.4)	216
Total	160	125	285

X^2 = 5.36, p<0.05*

Table 5: Mothers subjective health status according to type of contraception

Method of contraception	subjective well being		
	Good/fair (%)	Excellent (%)	Total
Condom	94 (83.2)	102 (99)	196
Pills	19 (16.8)	1 (1)	20
Total	113	103	216

X^2 (with Continuity Correction Factor) = 15.96, p<0.02*

Table 6: Subjective health status and participation in social support group

Participate in any social support group	Subjective well being		
	Excellent (%)	Good/fair (%)	Total
Yes	69 (54.3)	41 (25.5)	110
No	58 (45.7)	120 (74.5)	178
Total	127	161	288

X^2= 23.9; p<0.001*

Table 7: Mothers current health status according to what is done to remain healthy/prevent infection

What is done to remain healthy and prevent infection	Current health status Fair/good (%)	Excellent (%)	X^2 p-value
Nothing Good food	12(9.7) 112(90.3)	1 (0.9) 111(99.1)	8.9, p<0.01*
Nothing Positive living	12 (25.5) 35(74.5)	1(9.1) 10(90.9)	0.96, p>0.05
Good food Positive living	112(76.2) 35(23.8)	111(91.7) 10 (8.3)	11.65, p<0.01*
Nothing Good hygiene	12 (8.0) 139 (92.0)	1(0.9) 111 (99.1)	5.3, p<0.01*

*Statistically significant

DISCUSSION

Surveys are valuable in the understanding of self-assessment and behavioural changes over time in views and attitudes towards health, illness and well being[19]. The participants' mean age of 30.46±4.86 years and median parity of 2 (range 1-8; mean 2.42±1.38) are similar to that from a study in Jamaica with mean age 28 (15-41) years and median parity 2 (0-9)[20]. However, only 17.4% were unemployed as against Jamaica's average of 69%. Even though the socio-demographic parameters of the mothers in this study were not significantly associated with their subjective health status, yet another study[21];on health determinants of well being and life satisfaction showed that subjective feeling of wellbeing was predicted by younger age, marital status and employment.

The 75.8% of the participants in this study who used some form of artificial family planning is higher than the national average of 10% and SE Zonal average of 12%[22]. It is also higher than that found in a study in kitale Kenya which reported 44%[23]. Mothers who used condom for sex with their partners accounted for 69.1% and this is higher than the national average of 53%[22] and also from studies in Maiduguri and Kitale which reported 33.7%[24] and 38%[23] respectively. The high user rate for artificial family planning methods in this study is a reflection of the effectiveness of counseling sessions on use of contraceptives with the HIV positive women during antenatal period and again before discharge after delivery in NAUTH Nnewi.

Mothers who were on ARVs in the postnatal period were more likely to report excellent health status than those who were not on ARVs (X^2=28.6; p<0.001). This finding agrees with that from a study in Thailand which had shown that over 55% of patients reported excellent health status after commencement of ARVs[25]. The explanation for this trend may lie in the fact that study participants receiving HAART may recognize the value of the medication and be more likely to focus on their health and well-being, thus choosing to limit childbearing, at least in the immediate future.[26] In addition, women receiving

HAART have more regular contact with health care professionals as a function of the clinical follow-up that is required to monitor the health of individuals receiving therapy.

Mothers who used any form of contraception enjoyed better health status than those not using any contraception (X^2=5.36; p<0.05). Further disaggregation showed that those who used condom for family planning had better health status than those who used pills (X^2 [with CCF] =15.9; p<0.02). This agrees with the finding in Kitale by Bii SC et al which had linked use of condom with partner notification, male involvement in family planning, safe sex practices and support for the woman which indirectly leads to better life for her[23]. Furthermore these findings are consistent with those of a recent pilot study suggesting that contraceptive use was higher among HAART users compared with nonusers.[27] Since this study had earlier established a strong association between HAART use and a feeling of better health status among the subjects, it is hardly surprising to find an equally positive association between contraceptive use and subjective health status among them.

In this study, report of excellent health status was more from mothers who participated in support group activities than those who did not (p<0.001). This is similar to result obtained in another study where an appreciably higher proportion of patients in social support groups than those who do not belong reported good subjective health status[28]. This is a strong indication that social support plays a vital role in disease management and quality of life. The PMTCT programme offers mothers and their partners opportunity to adopt positive life styles in the context of primary prevention[11]. This is aimed at improving maternal health and subsequently reducing maternal morbidity and mortality[29]. This study assessed mothers health status according to what was being done to remain healthy and also prevent opportunistic infections[2].

It was found that mothers who were taking good food enjoyed better health status than both mothers doing nothing to remain healthy (p<0.01) and those observing positive living (p<0.01). Also mothers who were observing good hygiene enjoyed excellent health status more than those not doing anything to remain healthy (p<0.05). This is consistent with result of a subjective health evaluation which found a significantly poorer subjective well being among the malnourished group than among the well nourished group[30].

In conclusion, this study has shown a high contraceptive usage rate, especially with condom which gives dual protection against sexually transmitted infections and unplanned pregnancy and an improved subjective well being for the HIV positive mothers. Also the mothers reported improved subjective health status when they participate in social support group activity; when they are placed on HAART; when they take balanced nutrition; and when they observe good hygiene practices. Therefore the following recommendations are proffered:

1. Family planning education and services should be improved and made even more accessible to the mothers.
2. HIV positive mothers should continue to receive ARV in pregnancy and postpartum period according to current guideline.
3. Mothers should be encouraged to belong to and actively participate in social support group activities as this has proved beneficial to maternal health.
4. Health care providers should be aware of the immense contribution of the psychosocial make up of their patients and explore this for better overall health outcome.

LIMITATIONS TO THE STUDY

The cross-sectional data means that causal attributions cannot be made. The same is true for strict mediational analysis, which requires longitudinal data with at least three time-points. Our main outcome measure was of subjective health, meaning we cannot generalize the findings to objective health measures.

Implications for clinical practice: The implication of this study is that interventions which are successful in improving subjective well-being can have beneficial effects on aspects of health

Competing interests: The authors declare that they have no competing interests.

REFERENCE

1. Broder S, Gallo RC. A pathogenic retrovirus (HTLV-111) linked to AIDS. N Engl J Med 1984; 311: 1292-1297.
2. Park K. Opportunistic Infections. In: Park's Textbook of Preventive and Social Medicine, 18th edition, M/S Banarsidas Bhanot Publishers, India, 2005:87.
3. Anastos K, Barron Y, Miotti P. Risk of progression to AIDS and death in women infected with HIV-1 initiating highly antiretroviral treatment at different stages of disease. Arch Intern Med. 2002; 162: 1973-1980.
4. Cole SR, Hernan MA, Robins JM, Chmiel J, Detels R. Effect of highly antiretroviral therapy on time to acquired immunodeficiency syndrome or death using marginal structural models. Am J Epidemiol. 2003; 158: 687-694.
5. Simon V. HIV/AIDS epidemiology, pathogenesis, prevention and treatment. Lancet 2006; 368: 489-504
6. Quinn TC, Overbaugh J. HIV/AIDS in women: an expanding epidemic. Science 2005; 308: 1582-83
7. Shiselva O, Davids A. correcting gender inequalities is central to controlling HIV/AIDS. Bull World Health Organ 2004; 82: 812

8. FHI. Preventing Mother-to-Child Transmission of HIV: A Strategic Framework. FHI Institute for HIV/AIDS, 2004. Arlington, VA. 5-35
9. Federal Government of Nigeria. National HIV/AIDS and Reproductive Health Survey (NARHS), Nigeria. 2003: 2.
10. Federal Ministry of Health. Technical Report on the 2005 National HIV/Syphilis Sentinel Survey among Pregnant Women attending Antenatal clinics in Nigeria. 2005: 3-33.
11. FMOH. National Guidelines on Prevention of Mother-to-Child Transmission of HIV, July 2007
12. Okun M. A, Stock W. A, Haring M. J, Witter R. A. "Health and subjective well-being: a meta-analysis". *The International journal of aging & human development* 1984; **19** (2): 111132.
13. Diener E, Chan M.Y. "Happy People Live Longer: Subjective Well-Being Contributes to Health and Longevity". *Applied Psychology: Health and Well-Being* 1984; **3**: 143.
14. Wilson, I. B., & Cleary, P. D. Linking clinical variables with health-related quality of life. *Journal of the American Medical Association,* 1995; *273:* 59-65.
15. Hammond WP, Matthews D, Corbie-Smith G. Psychosocial factors associated with routine health examination scheduling and receipt among African American men. J Natl Med Assoc. 2010 ;102(4):276-89.
16. Araoye MO. Research Methodology with Statistics for Health and Social Sciences. NATHADEX Publishers, Ilorin, 2004; 117-118.
17. De Cock et al. Prevention of mother-to-child HIV transmission in resource-poor countries: translating research into policy and practice. JAMA 2000, 283: 1175-1182
18. Onwasigwe CN. Medical Research Project: A Practical Guide. EL 'DEMAK Publishers, Enugu, 2004: 129
19. Swain, V.JSocial relationships and health. In Health and Lifestyle Survey, 7 Years On (ed. B.D. Cox, F.A. Huppert & M.J. Whitelow). Aldershot: Dartmouth.0. 1993; (1): 43-53
20. Harvey K, Thame I. 2004. The Impact of a Programme to Prevent Mother-to-Child Transmission of HIV: Disease Transmission and Health-Seeking Behaviour among HIV-Positive Mother-Child Pairs in Jamaica. Operations Research Results. Bethesda, MD: Published for the United States Agency for International Development (USAID) by the Quality Assurance Project (QAP). Assessed at www.qaproject.org on 31/12/07)
21. Koukouli S, Vlachonikolis IG, Philalithis A Socio-demographic factors and self-reported functional status: the significance of social supportBMC Health Serv Res. 2002; 2: 20.
22. National Population Commission (NPC) and ICF Macro. 2009. Nigeria Demographic and Health Survey 2008: Key Findings. Calverton, Maryland, USA: NPC and Macro.
23. Bii SC, Otieno-Nyunya B, Siika A, Rotich JK. Family planning and safer sex practices among HIV infected women receiving prevention of mother-to-child transmission services at Kitale District Hospital. East Afr Med J. 2008; 85(1):46-50.
24. Moses AE, Chama C, Udo SM, Omotara BA. Knowledge, attitude and practice of ante-natal attendees toward prevention of mother to child transmission (PMTCT) of HIV infection in a tertiary health facility, Northeast-Nigeria. East Afr J Public Health. 2009; 6(2):128-35.
25. Hultqvist E, Martensson T, Samnang V, Andersson R. HIV-infected Thais need help to adjust to a normal life in society. J Int Assoc Physicians AIDS Care (Chic Ill). 2009; 8(5):277-278.
26. Maier M, Andia I, Emenyonu N, et al. Antiretroviral therapy is associated with increased fertility desire, but not pregnancy or live birth, among HIV+ women in an early HIV treatment program in rural Uganda [published online ahead of print April 4, 2008]. AIDS Behav PMID: 1838 - 9364.
27. Kaida A, Gray G, Bastos FI. The relationship between HAART use and sexual activity among HIV-positive women of reproductive age in Brazil, South Africa, and Uganda. AIDS Care 2008; 20:2125.
28. Ware JE, Snow KK, Konsinski M, Gandek B: *Manual and Interpretation Guide: SF-36 Health Survey.* Boston: The Health Institute, New England Medical Center; 1997
29. Mosack KE, Weinhardt LS, Kelly JA, Gore-Felton C, McAuliffe TL, Johnson MO, et al. Influence of Coping, Social Support, and Depression on Subjective Health Status Among HIV-Positive Adults With Different Sexual Identities. Behav Med. 2009; 34 (4):133-144.
30. Ilana F, Larisa G, Hana C, Ilana H-B, Natalya B, Miruna E et al Characteristics of undernourished older medical patients and the identification of predictors for under-nutrition status ***Nutrition Journal*** **2007;** 6**:37**