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Use of Dietary and Herbal Supplements among Elderly Ghanaians in the Keta Municipality

Richmond NO Aryeetey*, Solace M. Tamakloe

Department of Public Health, University of Ghana, Ghana

***Corresponding author**

Richmond NO Aryeetey, Department of Public Health, University of Ghana, P.O Box LG 13, Legon, Accra-Ghana, Tel: 233-24412-9669; Email: raryeetey@ug.edu.gh

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Abstract

Background: Globally, dietary and herbal supplements (DHS) are used frequently by adults and especially the elderly to control and prevent chronic disease. However, little is known about DHS use in sub-Saharan Africa. We estimated the prevalence and frequency of DHS use among elderly residents of the Keta Municipality in Ghana.

Methods: A descriptive cross-sectional survey was administered to 580 male and female elderly (65+ years) residents in the Keta municipal area in the Volta region. Respondents were selected using a multi-stage sampling approach involving random selection of sub-municipalities, communities and individuals at each level. The survey tool developed for the study collected recall data on socio-demographic characteristics; DHS use behaviour, health history, and reasons for using DHS. Logistic regression analysis was used to identify independent determinants of DSH use.

Results: About 42% of respondents reported use of a DHS in the last month. Almost 90% of users reported use of multivitamin or mineral supplements. More than 90% reported taking their supplement on a daily basis and more than 65% of users took supplements at least twice daily. Elderly who have completed secondary school or higher level of education were significantly more likely to use any DHS (OR=4.9; 95% CI: 2.08, 4.93). Those who were regularly taking medicines for any diagnosed disease were more likely to also take supplements (OR=17.9; 95% CI: 10.0, 32.0). The main reasons for using DHS was to improve health (90.5%). About half of DHS users identified health workers as their prescribing source (59.5%). However, 30% of all users indicated self-prescription for DHS.

Conclusion: Multivitamin supplements and to a less extent, herbal supplements are used regularly by almost half of elderly Ghanaians residing in the Keta Municipality. The public health system needs to recognize this frequent use of DHS and to assure safety in their use among this critical age group.

BACKGROUND

Much evidence exists already regarding the high and rapidly growing dietary and herbal supplement (DHS) use behavior among the elderly in the developed country settings [1]. Micronutrient malnutrition is a common problem in the elderly due to age-associated physiological changes that affect their nutritional health. Examples of these include; missing or poorly fitting teeth, difficulty in swallowing, blunted appetite regulation, reduced secretion of digestive enzymes and also impaired absorption of certain micronutrients among this age group [2-4]. As a result, frequent use of DHS is employed to address deficits in dietary intake. Although multivitamin supplements have not been shown to prevent several major chronic diseases, they do substantially increase vitamin and mineral intakes and blood concentrations, thus improving overall micronutrient status. Some single-nutrient supplements have shown benefits for preventing or reducing risks for chronic diseases. Use of DHS is, however, associated with factors like older age, being female, higher education and income, health status and healthful behaviors [5].

Excessive and inappropriate use of DHS among older adults has been recognized as a significant public health problem [6,7]. Vitamins and minerals in DHS may interact with some class of medications and result in adverse clinical outcomes. Adverse

outcomes due to excessive increase or decline in nutrient or drug concentrations or their synergistic combined effect can be problematic [6]. Older adults are especially vulnerable to these adverse effects because they have more vulnerable to rapid perturbations in their metabolic control systems. Also, due to the onset of age-related disease occurring at this stage of life, they are more likely to be using multiple medications at this stage of life.

Although there have been some experimental studies on dietary supplements use among pregnant women and children in Ghana, (Adu-Afarwuah et al., 2008), there are no studies on the use of DHS among the elderly. Patterns of use of DHS are not known in Ghana and other sub-Saharan African countries, outside of South Africa[1]. Therefore, the current study among the elderly in Ghana, will provide useful evidence on DHS including use prevalence, patterns of use, types that are most commonly used, and the characteristics of DHS users.

METHODS

A descriptive cross-sectional survey design was used in the study. A questionnaire was administered to 580 adults aged 65 years and above living in urban and rural communities in the Keta municipality in the Volta Region of Ghana. A multistage sampling technique was used to select a representative sample. First, three out of six sub-municipalities were selected by ballot, followed by another ballot selection of two catchment areas (administratively defined by the health directorate) in each of the 3 sub municipalities. Thereafter, a quota was allocated to each of these catchment areas in proportions based on their sizes. The study subjects were then sampled from homes in a total of 24 communities (both rural and urban) from these catchment areas. The population consisted of individuals of both sex with different backgrounds; levels of education, employment status and sources of income. Face-to-face Interviews were completed by trained field assistants. The questionnaires were used to collect information on DHS use, personal characteristics (including age, sex, employment status, and income), health status, health seeking, and reasons for using DHS.

DHS use was determined by recall in the last month and also through identification of supplement content information on medication bottles or packs, if available at home. In this study, a dietary supplement was considered to be any product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, a mineral, an herb or other botanical, an amino acid, a dietary substance for use by man to supplement the diet by increasing the total dietary intake, or a concentrate, metabolite, constituent, extract, or combination of any these ingredients and is intended for ingestion in a form a pill, capsule, tablet, or liquid. Information on how long they had been using DHS products, how often they use it in the past 7 days and how many times they used it in a day were recorded. Information on diagnosis of any chronic illness in the past 10 years was also self-reported by respondents. Self-reported Health status was determined based on response to five Likert-type statements to which they were asked to agree or disagree with. Limitations of this study include the use of recall for estimate DHS use, as well as encountering missing data for 18% of monthly income data which respondent's either refused to provide or were unable to recall. The study was reviewed and approved by the Ghana Health Service Ethical Review Committee. Participation was voluntary. All participants indicated their consent by completing a consent form which was either signed or thumb printed as appropriate.

Statistical analysis

Data were analyzed using SPSS 16 (IBM, USA) for analysis. The analysis included descriptive statistics of the socio-demographic and health information (proportions). Responses to the self-reported health statements were scored ranging on a scale from 1 to 3 for disagree, neither agree nor disagree, or agree, respectively. The scores were summed to determine the perceived health index for each individual. The scores were classified as low, medium or high using the inter-quartile ranges. Type of dietary supplement used was considered in terms of whether supplement was processed by a licensed factory or a locally made product without certification. Type of supplement was also categorized according to the micronutrient composition of the supplement; single or multiple vitamins and mineral, a combination or herbal supplements.

Bivariate logistic regression was used to compare proportions and to determine if there were associations between each of the independent factors and the dependent factors. Multivariate Logistic regression analysis models were also used to determine the independent association between DHS use and user characteristics. Only variables that were significant in the bivariate analyses were included in the logistic regression. In addition, the variables "sex" and "age" were selected as predictors for each model based on their biological importance. Results were considered to be statistically significant if $P \leq .05$.

RESULTS

Table 1 summarizes the socio-demographic characteristics of the study respondents. Majority of the 580respondents (72.0%) were females. Their mean age was 74.4± 7.9 years (range: 65-104 years). About two-thirds of respondents (60.9%) had no formal education. Only 13.2% of the females had completed junior high school level education compared to 60.0% of the males. Almost two-thirds of respondents (61.4%) were living in rural communities. About half (52.6%) were unemployed and35.5% were engaged in income-earning activities. About 58.0% reported they received monthly remittance as their main source of income; altogether, 87.0% of respondents reported that they received a monthly income. The average income reported was 110.7±154.8 Ghana Cedis (range= 5.00 to 1150.00). Average male monthly income (170.1 + 220.9 Ghana Cedis) was significantly greater than average female income (86.8 +109.9 Ghana Cedis), ($p<0.001$).

Almost all respondents (92.4%) reported they had been previously diagnosed with at least one chronic health condition, risk factor, or were currently experiencing pain. The most frequently reported chronic conditions/risk factors reported were: joint pain (66.6%), elevated blood pressure diagnosis (46.9%), back pain (29.1%) and insomnia (29.0%). Male respondents were more likely than females to report joint pain ($p=0.013$) or elevated blood pressure diagnosis ($p<0.001$).

Table 1: Background Characteristics of elderly residents of Keta Municipality (N=580).a

Socio-demographic characteristic	Frequency	Percentage
Sex		
Male	165	28.4
Female	415	71.6
Age groups (years)		
65-69	317	54.7
70-74	194	33.4
75-79	58	10.0
80-84	11	1.9
Location		
Rural	356	61.4
Urban	224	38.6
Level of Education completed		
None	353	60.9
Primary	73	12.6
JHS/ middle	106	18.3
Secondary and higher	48	8.3
Employment status		
Unemployed/retired	374	64.5
Currently employed or farming	206	35.5
Receives paid Income	473	81.6
Receives remittance	366	61.3

Figure 1 presents a summary of the perceived state of health reported by respondents. Regarding perceived health status, 27% of respondents reported their perceived health status to be high. Self-perceived health status was not different across males and females.

Less than half of the respondents (41.7%) reported using at least one DHS in the past week (38.8% of men and 42.9% of women). In bivariate analysis, use of DHS was not associated with respondent sex, perceived health status index, and receiving monthly remittance. However, those who reported no income were significantly less likely to use DHS ($p<0.001$). Also, DHS use behavior was significantly more likely among the elderly with secondary or higher education level ($P<0.001$).

Table 2 shows the pattern and frequency of use of DHS segregated by the characteristics of the elderly. Morethan two-thirds reported they use the DHS daily. The median daily frequency of DHS use among all respondents was twice. More than half of users indicated their supplements were prescribed by a health worker (59.5%). However, almost a third (30.2%) decided to use a DHS by them. Only 5.8% reported use of DHS recommended to them by friends or other people they know. The main sources of the DHS reported by users include hospital/ clinic (47.5%), pharmacy or chemical store (40.0%), provided by children/relatives (10.3%), and other private marketers (5.8%). Less than 2% of users prepared their own DHS at home.

The most frequently reported reason for supplement use was for health improvement or maintenance (90.5%). A minimum of 20 Ghana pese was and a maximum of 200 Ghana Cedis was spent on monthly supplement supply. Only 36.5% of users had DHS costs covered by the National Health Insurance program. DHS categories used by respondents, shows that most (82.2%) were using multivitamins and minerals supplements. About 15.0% reported combined use of herbal and vitamin/mineral supplements, inclusive of 23.2% who reported use of any herbal supplements.

About 62.4% of the supplements being used were manufactured locally in Ghana; only about 2% were found to be home-made preparations. Altogether, about 97.5% of the supplements had a manufacturer's label. While 3.6% reported awareness of potential side effects related to the supplements they are using; only one respondent reported experiencing side effects from using the DHS.

As shown in Table 3 below, in a multiple logistic regression model, tertiary level education and use of other medications predicted use of DHS among the elderly in the Keta municipal area. Those reporting taking other medications were 19 times more likely to use DHS than those who are not whilst those with tertiary level education were also 19 times more likely to DHS

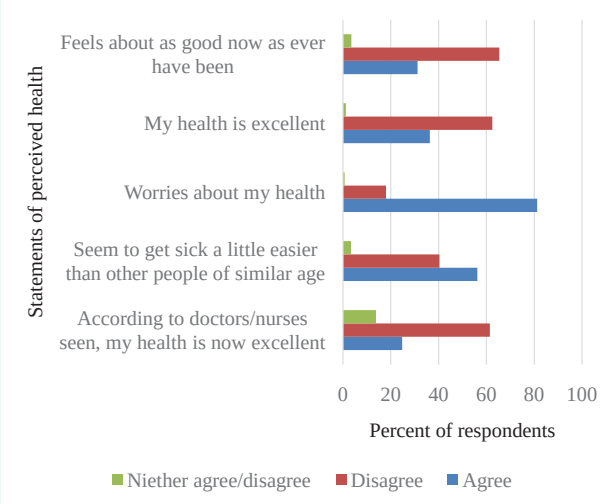

Figure 1 Perceived health status of elderly residents in the Keta Municipal Area, Ghana (n=580).

Table 2: Pattern of Dietary Supplement Use among Elderly Residents in the Keta Municipality, Ghana (N=242).

Socio demographic characteristics	Number	% of DHS* users	Use DHS* at least once daily	using DHS* because friend or neighbour recommended it	Use locally prepared¥ DHS*
Sex					
Male	64	26.4	90.6	15.6	12.5
Female	178	73.6	93.8	7.3	11.8
Location					
Rural	130	53.7	92.3	10.7	10
Peri-urban	112	46.3	93.8	8.5	14.3
Education level completed					
None	131	54.1	93.2	8.4	11.5
primary	32	13.2	96.9	9.4	15.6
Junior High	45	18.6	88.9	11.1	11.1
Senior high or higher	34	14.0	94.1	11.8	11.8
Has no source of monetary income	18	7.4	94.4	5.6	22.2
Receives remittance	162	66.9	92.6	9.3	11.7

*DHS=Dietary and herbal supplement
¥ Locally prepared in Ghana

Table 3: Multivariate model of socio-demographic factors associated with dietary and herbal supplement use among elderly in the Keta Municipality, Ghana.

Explanatory variable	Odds Ratio	95% Confidence interval
Sex		
Female (reference)	-	
Male	0.54	0.35-0.86
Age	1.01	0.99- 1.03
Education level completed		
None (reference)	-	
Primary	1.43	0.78-2.61
Junior High	1.51	0.83-2.74
Secondary or higher	4.93	2.08-11.68
Income status		
Monthly income (reference)	-	
No income	1.89	0.98-3.65
On medication for disease conditions		
Yes (reference)	1	
No	0.06	0.03-0.1

than those with no education. Basic to secondary education was not a significant predictor for supplement use.

DISCUSSION

The current study has estimated the prevalence of DHS use among mainly rural-dwelling elderly Ghanaians in the Volta region of Ghana. The findings suggest that a little less than half (42%) of the elderly in this district use DHS regularly. To our knowledge, this is the first study of DHS use behavior among Ghanaians, apart from routine iron and folic acid supplements recommended for pregnant women [8]. While this finding is not quite different from observed DHS use prevalence in advanced country settings, [5] the prevalence is surprisingly high for a mostly rural-dwelling group of elderly men and women the Keta District of Ghana. The study also highlights the need to know even more about the DHS use behavior among different segments of the Ghanaian population. This is because, there is evidence of an increasing middle class, urbanization, and non-communicable disease (NCD), [9-11] in an environment where the health system response to NCD remains rudimentary and inaccessible to many in Ghana. Perhaps, the relatively high prevalence of DHS use in this municipality may underlie a high unmet need for nutrients in the general population. This gap in knowledge can be revealed in further studies collecting both dietary data and supplement use behavior. The study may also have wider implications for other low income settings in Sub-Saharan Africa where limited evidence exists on DHS use in the general population.

Previous studies on dietary supplements use have reported that users were more likely to be female, older, and more highly educated than non-users [3,5,12]. In the current study, these differences were not observed, with the exception that there were

more users among the elderly with post-secondary education than among non-educated. While we do not know the basis for this association, we can speculate that purchasing power of more educated groups partly explains this relationship. While earlier studies also demonstrate that users often have better nutrient status than non-users. In this current study, this relationship could not be explored because dietary data was not collected.

Most users reported disease prevention or health maintenance as their main motivation. Considering that about 40% of respondents wither either self-prescribing or taking their cue from significant others, suggests unmet need for health services. This finding should be interpreted within the context of the Ghanaian health system which currently offers limited-access preventive services designed to meet the specific health and nutrition needs of the elderly in Ghana [13]. Policy and programs are needed to both address health and nutrition needs of the elderly as well as preparing the younger generation are age in a healthy way. In Ghana, a national Aging Policy has been developed and validated awaiting official Government approval.

CONCLUSIONS

Multivitamin supplements and to a less extent, herbal supplements are used regularly by almost half of elderly Ghanaians residing in the Keta Municipality (42%). Higher education is a statistically significant determinant of using dietary and herbal supplements. Although a greater proportion uses multivitamins and vitamin/mineral combinations; about 23% also use herbal supplements and 15% use dietary and herbal supplements together. A high proportion also use the supplements based on self-prescription (30.17%). Interventions are therefore needed to ensure safe use of supplements in this vulnerable age group.

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