Geriatric Needs in Libya: Extracting Predictors through Logistic Regression

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Abstract

Old age, the golden age, is characterized by diminished capacities of biological, social and mental faculties. Societies and their health and social care systems exert efforts to support by means of supplements - both informal and formal. National Health Systems have empowered primary health care mechanisms in order to provide ambulatory care services to geriatric population. Geriatric care has realized by Libyan National Health System through the Health Decree 1994 that legalized care of older persons as part of primary health care. Logistic regression model consisting of demographic, social, economic, familial, lifestyle and medical requirement variables are tested with health need variables namely, number of health complaints, perceived level of service at home, admission to hospitals in the last one year, transportation arrangement to access primary health care and perceived cost of care. The exercise was carried out on a data set collected from a sample of older persons, selected from 5 primary health centres and 5 polyclinics located at various parts of Benghazi city. While a large majority of older persons suffer from multiple pathologies, a lesser proportion had unmet expectations from their family. Hospitalizations were realized to be high (three-fourth of the sample) while transportation arrangements were fairly family based. A large majority has unfavorable perception about cost of care. These health needs are predicted to be based on variables; most importantly the economic, which was followed by life style, social dimensions, and perceived health. Demographic and familial variables play a less important role. Older persons are divided into two groups viz., (i) having greater need and (ii) having lesser need, based on the five dependent variables. A gender dimension in case of multiple pathologies and age dimension and marital status for satisfaction with care at home were revealed. Economic and life style variables play havoc in determining health needs. Well, within the cultural context and by incorporating geriatric care principles and theories, efforts shall be made to integrate care of older persons within the national primary health care and tertiary care sectors. Older persons in Libya are under conditions of multiple pathology, varying levels of health needs and perceptions depending largely on their economic, life style and socio-demographic background.

Key words: Logistric regression, ageing, health needs, family, hospitalizations, health complaints, transportation, cost of care

Introduction

"Old Age is a Golden Age". Graying of population is a universal phenomenon. Along with the world, Libyan population is also ageing; slowly but steadily (1,2,3). This demographic phenomenon characterized by declining fertility and mortality resulting in accelerated life expectancy has importance in health and health care service provisions. Effects of ageing namely physical incapacity, biological deterioration, disabilities and psychological stressors - bereavement and dependency (4) are exacerbated in societies like Libya due to rapid transition in demography (5), epidemiology and health status resulting from industrialization, urbanization and modernization (6). The corresponding advancement in standard of living adds years to life but with hurdles on health and health care in old age due to social and economic concerns (7) created by dependency burden (2) and increasing cost of child rearing. The increasing emphasis on responsible parenthood dilutes the filial responsibility.

Health reforms to accommodate care of older persons in Libya has its legal sanction from Health Decree No. 24 of 1994, which promulgated restructuring of Primary Health Care (PHC) within the National Health System (NHS) by incorporating healthcare of older persons (Geriatrics) as a component (8). Health needs of older persons are addressed within the existing primary health care system as along the ongoing serious efforts to provide consultation services to geriatric patients (9). Introduction of Geriatrics as a speciality in the new millennium has also been stressed by Libyan medical fraternity (10).

Old age has serious diseases, mostly disabling, namely cardio-vascular diseases, cerebro-vascular diseases, disorders of loco motor system, urinary incontinence, respiratory diseases, sensory diseases and neurological and psycho-geriatric diseases (depression, Parkinson's disease, Alzheimer's disease, insomnia, dementia etc.) (11) and physical conditions leading to immobility and impaired homeostasis (12).

While the PHC system serving as first level of care; geriatric hospitals, geriatric wards, rehabilitation centres, long stay hospitals and hospices are the other measures to care for older persons. While focusing on these formal care systems, there is an increased need for maintaining or strengthening the informal care system (13). With such an approach, the United Nations mandates of "age family integration", "developmental approach to ageing" (14) and "promoting a society for all ages" (15) are possible. Informal care system consisting of immediate kith and kin serves as the prime care giving system (16). Relatives and neighbors are also important in caring for older persons. Strengthening such informal networks by way of increasing involvement of elderly in household and family matters, religious matters and household decision shall reduce the perceived burden of ageing.

It was in this context of increasing importance of health care for old aged population, this study was executed to assess health needs of elderly in Libya by taking a representative sample in a major geographical region - Benghazi. The specific objectives were (i) to explore health needs and living conditions and (ii) to identify significant predictors of health needs.

Methods

This cross sectional study was based on a survey conducted during Jan-Mar, 2009 in Benghazi city by selecting a sample of persons aged 60 years and above (popularly defined as old aged) from 5 primary health centres and 5 polyclinics (17). Data collection was carried out as exit interviews (structured face to face). Data was gathered on (i) personal profile (ii) living arrangements (iii) health seeking behavior (v) care received at home (vi) quality of care and (viii) care needs namely, medical supplies, sanitary pads, supportive equipments and transportation to seek medical care. These variables were identified through reviewing profile of patients at geriatric divisions namely (i) having multiple medical problems (ii) receiving care from multiple subspecialists (iii) undergoing recurrent hospitalizations (iv) experiencing functional decline and (v) having complaints other than classic symptoms or diseases (18).

From a preliminary analysis, a few parameters were extracted to explain needs of older persons such as number of health problems, perceived level of satisfaction with services at home, admissions to hospital inpatient division during the last one year, arrangement of transportations to reach the primary healthcare facility and perceived cost of health care. These variables were dichotomized by assigning '1' to show greater need and '0' to show lesser need. These parameters were compared with recommendations namely care to alleviate handicaps, consideration of well being, early diagnosis, care for daily living, reducing cost of health care, participation of older persons, allied health services and nutritional care (14) and also with health promotion and wellbeing, access to health care services, training of professionals and disabilities (15). Variables such as age, sex, place of residence, type of house, working status and education are used to explain differentials in Libyan population (19). Determinants of regular physician visits namely being female, advancing age, illness, self rated health and urban residence (20) is comparable. Another model - determinants of heath - includes financial status, caregiver, work in the household, marital status, education, time spending with care giver and religious engagements (21). Social care model stresses the importance of informal care (primary - kin and secondary - neighbors and friends) in comparison with quasi formal (mediating elements), formal voluntary and governmental service organizations and formal political and economic institutions (16). A model that explains life style of older persons including demographic, social, economic, living arrangement, life style and perceived need for referrals; dichotomized (0 and 1) was adopted in this study to explain health needs. Binary logistic regression analyses were carried out separately for each dependent variable taking the model independent variables (predictors).

Analyses using logistic regression model were proved to be reliable in Public Health and Demography as it assesses effect of a set of variables on a particular heath concern (22).

Results

Life changes in old age as also health needs depending, largely upon family care giver, financial means and Governmental support to meet needs (23). Concentration of diseases and disabilities, unhappiness with kith and kin, frequent hospitalizations, dependence on transportation and perceived cost of care are few of the dimensions of geriatric care as the elderly face a multiplicity of health problems varying from minor illnesses to chronic disabling conditions.

Health services for the geriatric population in Libya within the publicly administered primary health care are health centres and polyclinics offering routine checkups and treatments. In addition, elderly consult specialized physicians at secondary/tertiary sector hospitals in case of chronic diseases. Nearly half of those who seek care at PHC level in Benghazi face three or more diseases, which are under treatment as revealed earlier (24). With age, after superannuation from traditional or modern sector, people restrict themselves to their homes depending either on spouse or on children and grandchildren, expecting basic health care requirements. The provisions available at home depend upon the financial situation, the intergenerational relationships, the 'give and take' approach within the family and the culture of cordiality and care nourished through years. It is more subjective and perceptual rather than objective and factual. Three-fourth of the sample in this study, perceive care as satisfactory.

As along increasing life expectancy, morbidity and disability compress to a narrow range prior to death (14), where health seeking behavior including hospitalizations remained higher (20, 25). There were evidences that the most frequent users of more expensive national health system were elderly (26). The particular population group in the Libyan city had one-fourth admitted to hospital during the last one year. These hospitalized treatments were additions to their regular treatments at primary health care level and routine ambulatory care. A large share of hospital beds were occupied by older persons, which shall continue in the context of new technology pressured by rising cost (4). Transport was one of the most important concerns in Benghazi where public transport systems were poorly organized. Almost everyone in the city travels by their own vehicles or vehicles owned and driven by their kith and kin. Superannuated older persons, who were physically incapacitated, after years of service to the nation and to the family, expect to reach places of their importance in a vehicle of privacy; large majority- seven-tenths - have such fortune (Table 1).

Table 1: Geriatric Needs - Dependent Variables

Variables	Number	Percent
Number of health complaints		
1/2	162	50.5
3 or more	159	49.5
Perceived level of services at home		
Excellent	236	73.5
Others	85	26.5
Admitted to hospitals in the last year		
Not admitted	245	76.3
Admitted	76	23.7
Transportation arrangement		
Own vehicles or son/daughter's	225	70.1
Others	96	29.9
Cost of medical care		
Affordable	137	42.7
High	184	57.3
Total (N)	321	100.0

Medical care cost shoot up recently followed by globalization, competition and medical tourism. Import of state-of-the-art technology from developed countries, sophisticated high technology medical treatments, purchasing medicines and medical aides from other parts of the world, requirements of geriatric aides - adult pads, wheel chairs, special beds, catheters and dental and chiropody aides - created burden on meeting health expenditures. More than half of the persons felt that medical care was costlier even though primary and secondary level care was free under the national health system.

This is the scenario of geriatric care needs in Libya which was explicitly brought out. There were certain reasons or background from the public life say, demographic, social, economic, living arrangement, life style or medical requirement. These variables were dichotomized to apply logistic regression (22). Demographically, three-fourths of the persons in the sample were of age 60-69 years (Table 2). There were more females attending primary health care facilities than males. A lower proportion of these persons were currently married. Socially, a large majority had no formal education. It might be that they had religious education from the 'Madrasas`' locally. Economically a large majority was previously unemployed. At present all of them have at least one household member at work. A large majority (i) live at homes having more than 5 members (ii) had people other than the next kin in their households (iii) were urban dwellers. Life style wise, a large majority felt that they were (i) undernourished and (ii) having some form of exercises. Medically more than one-fourth required referral.

Table 2: Background Variables (Predictors)

Variables	Number	Percent
Demographic		
Age		
60-69	243	75.7
70 and above	78	24.3
Sex		
Male	135	42.1
Female	186	57.9
Marital status		
Other than currently married	109	57.9
Currently married	212	42.1
Social		
Education		
No formal education	216	67.3
Others	105	32.7
Economic		
Previous employment		
Working	154	48.0
Unemployed	167	52.0
Number of earning members		
Only 1	160	49.8
2 or more	161	50.2
Familial		
Number of persons at home		
Less than 5	112	34.9
5 or more	209	65.1
Co-residing member		
Children	138	43.0
Children and Grand children	183	57.0
Location of residence		
City Centre or Al Birka	176	54.8
Al Slawy or outside city	145	45.2
Life style		
Perceived Nutrition		
Require more	193	60.1
Not require more -satisfied	128	39.9
Exercises		
Exercising any form	196	61.1
None	125	38.9
Medical requirements - referral		
Referral		
Requires	85	26.5
Not requires	236	73.5
Total (N)	321	100.0

Predictors of health problems brought β values (coefficients) close to zero except previous employment (0.624), number of earning members (0.732) and exercises (0.744). Positive coefficients were obtained for age, sex, education, previous employment, number of earning members, referral requirements and exercises indicating that there were increases in dependent variable (Table 3). That is, being in age 70 years and above increases the number of heath complaints. Similarly being a female, having some education, no previous employment, having 2 or more earning members at home, not requiring referrals and not having any physical exercises increases the condition of having three or more health complaints. At the same time, being currently married, having 5 or more members at home, co-residing with grandchildren or in joint families, residing in the outskirts of city (Al Slawy) and being satisfied with the nutritional intake made a negative effect on number of health complaints, i.e., these conditions reduces health problems in old age.

Table 3: Regression Coefficients - β and odds ratio

Predictors	Health Problems			Perceived level of services at home			Admission to hospitals			Transportation to health care facility			Perceived cost of care		
	B	Exp(B)	Sig.	B	Exp(B)	Sig.	B	Exp(B)	Sig.	B	Exp(B)	Sig.	B	Exp(B)	Sig.
Age															
70 years and above	.198	1.219	.503	-.123	.884	.714	-.294	.745	.396	-.294	1.294	.410	.145	.1.156	.618
Sex															
Female	.304	1.356	.458	.356	1.427	.423	.225	1.252	.636	.225	2.259	.066	.479	1.165	.245
Marital status															
Currently married	-.124	.883	.740	1.127	3.086	.014	-.471	.624	.292	-.471	1.542	.282	-.408	.665	.279
Education															
Having some education	.003	1.003	.993	.396	1.486	.260	-1.181	.307	.003	-1.181	1.001	.998	-.046	.955	.883
Previous employment															
None	.624	1.866	.113	-.476	.621	.257	-.931	.394	.041	-.931	.458	.063	-.467	.627	.247
Number of earning members															
2 or more	.732	2.080	.006	.048	1.049	.871	.244	1.276	.441	.244	.569	.043	-.047	.954	.852
Number of persons at home															
5 or more	-.277	.758	.326	.641	1.898	.053	.171	1.187	.612	.171	1.138	.662	-.117	.889	.667
Co residence															
Children and Grand children	-.081	.922	.815	.611	1.842	.156	-.035	.965	.931	-.035	1.201	.624	-.614	.541	.077
Location of residence															
City outskirts	-.065	.937	.789	.420	1.522	.120	-.006	.994	.982	-.006	.625	.073	.282	1.326	.237
Perceived nutrition															
Satisfactory	-.276	.759	.259	.888	2.429	.001	.196	1.216	.500	.196	1.498	.118	-.320	.726	.241
Exercises															
None	.744	2.104	.004	.378	1.460	.189	1.109	3.030	.000	1.109	.659	.134	.458	1.581	.057
Referral requirement															
No requirement	.196	1.217	.478	.235	1.265	.451	-.613	.542	.045	-.613	1.389	.281	.252	1.287	.315
Constant	-.964	.381	.080	-3.235	.039	.000	-.644	.525	.313	-.644	.325	.060	.673	1.961	.216

The β coefficients for the dependent variable "perceived level of services at home" brought females, not currently married, having some formal education, having 2 or more earning members, having 5 or more members at home, co-residing with grandchildren and others, residing at the outskirts of city (Al Slawy), having requirement for referral, perceived satisfaction with nutritional intake and having exercises was more likely to be comfortable with domestic life situations (positive predictors). At the same time being in 60-69 years and having some previous employment made the elderly feel less comfortable with services at home (negative predictors). There were significance in case of nutritional requirement and marital status in predicting ones happiness with domestic life situations. While not requiring additional nutrition at home gives 2.4 times comfort with the existing level of care at home, not currently married gives 3 times comfort. It shows that, it was the need that was important to older persons. Those, who had alternatives often feel discomfort than those having no alternatives.

Predictors of admission to hospitals brought β values (coefficients) close to zero except for education (-1.181), previous employment (-0.931), referral requirement (-0.613) and exercises (1.109). Here there were positive coefficients and negative coefficients. Positive coefficients were obtained for sex, number of earning members, number of persons at home, nutritional requirements and exercises indicating that there were increases in dependent variable.

That is, being female, having 2 or more earning members at home, having 5 or more members at home, not requiring more nutrition and having no exercises increased the likelihood of getting admitted to hospital for inpatient care. On the contrary, being aged 70 years and above, being not currently married, having some education, previously unemployed, co-residing with grandchildren and others, staying at city outskirts (Al Slawy) and not required referral decreases the likelihood of getting admitted to hospital for inpatient care. There were significance in case of exercises, education, previous employment and referral requirement. Having no exercise was likely to lead to hospital admissions. This was a significant result (p=0.000) which brought an odds ratio of 3.0 indicting that the likelihood was 3 times more than those who regularly walk or jog. It might be true that those who do not exercise were in poor health (as revealed earlier). They faced health complaints requiring institutional care. Those older persons with no formal education were found to be hospitalized as compared to their counterparts with formal education (p=0.003; odds ratio =0.307). Older persons who were previously employed were likely to be hospitalized (p=0.041; odds ratio=0.394). It was those older persons who were in perceived requirement of referral were likely to be admitted to the hospital for institutional care (p=0.045; odd ratio=0.542). The odds ratios (exp β) were lower indicating that the likelihoods were less, mostly between 0.3 and 0.5; indicating that it shall be just half times more than their counterparts. Only in the case of exercise, a higher odds ratio was obtained (3.0).

Predictors of transportation to health care facility brought β values (coefficients) close to zero except in case of sex (0.815), previous employment (-0.780) and number of earning members (-0.563). Positive coefficients were obtained for age, sex, marital status, education, number of persons at home, co-residence, referral requirement and nutritional requirements indicating that there were increases in dependent variable. It means that those aged 70 years, females, not currently married, having some formal education, having 5 or more members at home, co-residence with grandchildren and others, having no referral requirement, having no additional nutritional requirement were more likely to depend on public transport to reach the health care facility (PHC level). On the contrary, previously unemployed persons, having only 1 earning member at home, residing in city area (City Centre or AlBirka) and having some form of exercise were likely to travel by own vehicle or of their children/daughter. Here the family sentiments and also the effect of sharing of responsibility of parental care were evident in such a manner that those who were in sympathetic conditions are getting attention from children also those who have no more than a single care giver. There were significance in case of number of earning members only (p=0.043). Older persons having just one earning member at home had own transport or that of their children, to reach the health facility. More the number of earning members, more they get themselves busy with their own private affairs and more the neglect (odds ratio = 0.569). Predictors namely previous employment, sex and place of residence obtained significance but beyond 5 percent level. It can be told, to an extent, that not being in employment previously, being a female and living in city area were also likely to avail one's own or children's transporting to the primary health care facility.

Predictors of perceived cost of care brought β values (coefficients) close to zero except co-residence (0.614). Positive coefficients were obtained in case of age, sex, place residence, nutritional requirements and exercises indicating that the perceived high cost of geriatric care depends upon the above variables. There were significance in case of nutritional requirement (p=0.057) and co-residence (p=0.077).

Discussions

Older persons in Libya were going through changing conditions of health care that are part of social transformations. As the living conditions and life style are changing rapidly along modernization, urbanization and industrialization; older persons with great struggle are moving along the mainstream with the care and concern from their kin and kith and with the support of community and formal sector

Epidemiological changes together with medical innovations made realization of various conditions of ill health and also varying specialized care giving for older persons; more and more older persons started seeking care for different illnesses. This trend has exacerbated with the promulgation of PHC in 1994; to include elderly care as a national component (8), thereby improving coverage and reducing disabilities while adding life to years. Thus, older persons in Libyai started realizing multiplicity of health problems; seeking health care services at various levels namely primary (health centres, polyclinics and health units), secondary (general hospitals) and tertiary (specialized centres).

Female older persons in Libya were undergoing treatment for a multiplicity of illnesses earlier to their male counterparts. While these illnesses were treated with services available under the national health system; a variety of care, concern and sentiments were critical at domestic level from immediate kin and kith. Nutrition, medications, medical aides, care givers and emotional support were the core of domestic level care for an older person. The prevailing family ties were favorable to older persons to receive care from home to an expected level. Those having insufficient – not to the expected level – care were majorly younger than those who receive excellent care showing that with increasing age, services increase or perceptions improve.

Old age has a compression of morbidity, which characterizes frequent consultation with medical fraternities including hospitalizations indicating (i) acute illness episodes (ii) attention from carers and (iii) inability to continue caring at home. Hospitalizations in old age result from need, demand and affordability-accessibility. There were large proportions who got admitted to hospital and who seek institutional care (one-fourth of the total). This high proportion had resulted as the sample was drawn from ill older persons.

Older persons seldom drive due to their diminished integration, sight, hearing and confidence. An expectation in old age is getting support for such weaknesses from kin, kith or others within the close circle. A large majority receive such care.

Perceptions of cost of care result from financial resources available, requirement of various services and existing prices as compared to olden days. Perceptions vary from individual to individual. A large majority of the sample felt the cost of care as higher. The Arab Plan of Action on Ageing identified advancing health and wellbeing into old age as one of the priorities: others are development and enabling supportive environment. The equitable access to health care in case of older persons without discrimination is an issue for debate (27).

Older persons in Libya live under varying conditions of demography, society, economy and family. These characteristics create differences on living arrangements, nutritional levels, physical activities and medical (referral) requirements. A large majority of older persons attending the PHC were aged 60-69 years; those aged 70 years and above were not many, attending PHC facilities. This might be because (i) that they were attending tertiary level facilities or were receiving home based care (ii) that primary health care facilities were incapable of catering to their needs or (iii) that the proportion of population aged 60-69 years and 70 years and above was reflected here.

As against the usual contentions, a large majority of older persons were currently married, which indicates existing patterns of life expectancy and lesser gender gap in health. Age distribution of currently married differs from that of others in such a way that the mean ages were 65.2 and 65.9 for currently married and others respectively. Again, there were differences between males and females in such a way that the mean ages were higher for males. These results confirm with the results of a similar study carried out in an Indian state (28).
The social characteristics reported by the older persons seem slightly doubtful because of the large proportion with no formal education. These results might be considered true as these older persons were born during the reign of Kings and colony, when there were no priorities for education. Economically, less than half of the older persons were in job during their productive years; a majority was in police or in teaching. At present, these older persons were living at homes where there were only 1 (49.5%) or 2 or more (50.2%) working members. These were the economic variables that speak out the living conditions as variables like income, type of job etc., do not capture the exact situation better than the above variables.

Family wise, Libyans live separately but with frequent and close interactions. As with the large families prevailing in the country, these older persons also live in large families (having 5 or more members). They were mostly co-residing with son/daughter in nuclear families (43.0%) or with son/daughter and others – grandchildren - in joint families (57.0%). A large majority of the sample were urban dwellers living within the city limits. A large majority of the sample showed comfort with their perceived nutritional levels. It is to be noted that sex was not a significant predictor in Libyan society. A level of significance at 6.6 percent was obtained in case of transportation to the health facility that females were more likely to depend upon public transport than males. The possible explanation might be that older women live without their spouse for years due to their existing gap in age and life expectancy (29, 30). This gender difference in widowhood and bereavement plays differences in Libyan society, to an extent, even though mother receives better care and consideration than father.

Determinants of health differ between male and female older persons that current work, involvement in household job, having some schooling, co-residence, financial condition, spending time with caregiver and religious engagements were predictors of good health among older men. The same for older women were household work, religious engagements and education (21). Household economy, previous employment and exercises were the predictors of health status in Libya's older population: the first two were double bind that whether the better economic status leads to (i) more heath complaints or (ii) better health seeking behaviors. The latter seems more appealing as it refers to awareness leading to utilization. So, economic status of household facilitates realization of health complaints and thus health seeking behavior. The third predictor namely, exercise keeps older persons fit, thereby having less number of illnesses.

Perceived nutritional level keep older persons happy about domestic level facilities, being currently married and having more number of persons at home keep them satisfied; thus making these three variables as predictors of happiness with domestic level services. Again, having no exercise appears as a predictor of hospitalization as along having no formal education or former unemployment. That is, hospitalizations were results of activity profile during younger years. It showed that a need for referral makes hospitalizations. As far transportation is considered, number of earning members at home was the only significant predictor. That is, economic situation of the family predicts the transportation for health care seeking. As regards the perceived cost of care, only the perception of nutrition was the significant predictor.

Important predictors of heath care needs of older persons in Libya were exercises, number of earning members at home, previous occupation and nutritional requirements. The two less important predictors were marital status and education. Number of members at home and referral requirements remain as least frequent predictors. A list of predictors of care seeking behavior include sex, household income, education, number of working adults, number of elderly at home, marital status and work status (31).

Specialized geriatric services with a behavioral resource person in adult day programs at Halton - Halton Geriatric Mental Health Outreach Program - (32) provides leads in developing a health care system that optimizes health, independence and quality of life of seniors with complex health problems. Offering comprehensive assessment and treatment plans that optimizes care planning promotes confidence and independence. This caution of making cost-effective inputs in improving public health services for the older persons offers a better distributive strategy and improvement in service delivery systems (29). Priorities of health sector namely prevention, diagnosis and treatment of diseases are integrated with the components of heath promotion (19); an integrated approach to suit social system, co-orindating resources and activities for Health For All (33). Primary health care, the basic right of all persons in every society (33) shall offer older persons care provisions within their family and community: special provisions are needed to oldest and frailest and those with functional disabilities, multiple syndrome and complex psychosocial need (18). And thus geriatrics sets priorities for (i) focus functions (ii) normal changes from disease changes (iii) number of diseases that alter nonspecific presentations (iv) expertise in geriatric syndromes and (v) practice of working in teams, apart from general medical care (18).

An array of services within the primary care shall include care of frail elderly, memory care, support group, diabetes education and subspecialities with a multidisciplinary team (social workers, nurses, nurse practitioners, physical-occupational therapists and audiologists), services namely phlebotomy, X-ray and electrocardiograph and subspeciality services (enhancing communication and easing transportation through rheumatology, neurology, dermatology, psychiatry and ophthalmology). This strategy enables patients, family members and physicians to know patients individually. Preparations at national health system level shall be geared towards providing care to older population along with their projected increase by (i) developing examples, models and resources (ii) showing the interdisciplinary nature (iii) developing strategic steps for implementation (iv) encouraging review of admission criteria (v) recommending a life course approach and (vi) promoting life course to advanced training (34).

The 11 step conceptualization of a geriatric care facility, namely promoting normal ageing, coping with secondary ageing, building networks, developing an holistic perspective, stressing the concept of ageing - physiological Vs. psychological, institutionalizing a policy of restrictive use of medicine, constant attention to avoid iatrogenic illnesses, creating rehabilitation and respite care, developing an interdisciplinary team, discouraging long stay and building elderly friendly institutions (35) is of high relevance.

Focus on socio-cultural factors rather than biomedical components recognize health professionals, community care providers and create a friendly primary health care system (36) where recent advances such as wireless networking, computing and sensing technologies are utilized to improve health status and lives of elderly.

Conclusions

Above discussion of results highlights the state of health, lifestyle, significant predictors of geriatric health and building geriatric care facilities. Elderly in Benghazi are in a state of multiple pathologies combined with backwardness in terms of social and economic conditions. The burgeoning needs of older persons in this city are (i) ambulatory care for disabling multiple pathologies (ii) specialized inpatient treatment for chronic debilitating diseases and (iii) affordable systems of care.

Health care needs vary across different population strata of older persons that household economy (previous occupation and current number of working members at home), life style (regular exercises), perceived satisfaction with nutritional care, education and referral requirements are primary determinants of health needs. At a secondary level sex, size of household, marital status, co-residence and location of residence determine health care needs. A less important predictor is the age. Still, it is felt that the model tested here does not capture the real predictors in the society. Efforts are needed further to understand the real dynamics of geriatric care needs.
Primary health care driven by Government of Libya is the place for the geriatric health care apart from the general hospital and the surgical hospital. Integration of geriatric system of care at primary level remains a public sector interest under NHS, which shall require careful consideration of geriatric principles and theories and intense efforts at strategic implementation.

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