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Editorial

Dr Abdul Abyad
Chief Editor

In this fifth issue of this year we have a number of papers dealing with awareness levels among elderly in Saudi Arabia, women's issues in India, effect of socioeconomic status, and drug-drug interaction from Iran, and impact of presbycusis and Hearing Handicap Inventory and hip replacement alternatives from Jordan.

A cross sectional study from Saudi Arabia assessed the level of awareness of elderly patients about using their medications. A self-administered questionnaire was distributed to 385 elderly patients attending outpatient clinics in King Khalid University Hospital. The results showed there is a positive relationship between using the medications properly and the education level. The authors concluded that a considerable percentage of elderly patients did not have sufficient and safe knowledge on the use of their prescribed medications. Physicians and pharmacists should strive to educate patients more fully about proper medication use and understand their difficulties.

A paper from India attempted to understand the association between living arrangements and health well being among elderly women. The authors utilized data from the Indian Human Development Survey (IHDS 2005). It was found that 83% of elderly women are living in a joint family and 3% are living alone in India. Women living in a joint family is higher in urban (84%) than rural (82%) areas. The authors concluded that the Elderly population, particularly women, are more likely to suffer with multiple health and psychological problems. There is an urgent need to pay greater attention to elderly women and to support programs for ensuring their health well being and social security.

A paper from Iran examined socioeconomic (SES) inequalities in the incidence of mental and physical disorders in old people. The survey asked questions on mental health measures, and physical health measures. A total of 402 elderly participated. The illiteracy rate was 46%; 55% had no financial support; 16% of elderly participants had no Medicare and private health insurance. High levels of anxiety and depressive symptoms were found in 11%, and 46.5% had a moderate level of distress. The authors concluded that Low SES predicted the incidence of depression and physical function limited in Iranian elderly. The economic difficulties in elderly adults were strongly associated with mental disorders and physical limitations.

A cross sectional study of potential drug-drug interactions was done among older patients who were admitted into intensive care unit in Kerman, Iran and data about all older patients who admitted in intensive care unit from January 1 to December 31, 2011 were detected from medical records. 77 different drug and 394 drug prescriptions was determined with mean of 5.6 (SD=1.5) for each patient. A total of 108 potential drug interactions were found in the first twenty-four hour's prescriptions. The highest form of potential drug interactions was delayed, moderate and possible. The author concluded that older patients who are admitted to intensive care unit are at high risk of potential drug interaction, so they need to be more considered by health care team members.

A cross-sectional study was done in Prince Ali hospital in al-karak and looked at the relation between the psychological impact of presbycusis and Hearing Handicap Inventory (HHIE-S) for the Elderly in Jordan. All the participants scored more than 8 in the HHIE-S. 56.5 % of participants scored more than 24 in the HHIE-S and 34.6 % of them complained of psychological symptoms. The findings from this cross-sectional study suggest that the psychological symptoms due to prespycusis increase significantly with aging if left untreated, and there is a proportional relation between HHIE-S score and the psychological symptoms.

A prospective study was conducted at Prince Hashim military hospital to evaluate treatment methods in femoral neck fractures to determine the most effective treatment. Patients enrolled in the study were assigned into two groups: group A that were treated by closed reduction and dynamic hip screws and group B were treated with hemiarthroplasty. In group A, 73 % of patients had excellent/good results, and 27% patients had fair/poor results. In group B, 68% patients had excellent/good results and 32% patients had fair/poor results. The authors concluded that there was no statistical difference between either group with regards to failure of the index procedure and re-operation rates, but there is a higher revision rate for femoral neck fractures treated with internal fixation versus those managed with hemiarthroplasty.

Original Contribution/Clinical Investigation

Assessment of elderly patients awareness on using their medications, at a teaching hospital, Riyadh, Saudi Arabia

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ABSTRACT

Background: Elderly people require special care and concentration in their life issues, especially in the sensitive matters such as medical and health aspects that require high levels of understanding and care.

Objective: The aim of our study is to assess the level of awareness of elderly patients about using their medications.

Method: A cross-sectional study design using convenience sampling technique was used in this study. A10 questions self-administered questionnaire was distributed to 385 elderly patients attending out-patients clinics in King Khalid University Hospital, Riyadh, Saudi Arabia between 28 January to 12 February 2012. Male patients aged 60 and older and who have at least one prescription were included in this study.

Results: The results showed there is a positive relationship between using the medications properly and education level. When we asked patients if they were using their medication in its proper way the result showed 266 (69.1%) of the total sample answered yes, 69 (17.9%) of the total sample answered sometimes and 50 (13%) answered no. And when we asked if the patients receive explanation about using the medication from the physicians and pharmacists, the average of patients who receive explanation from doctors is higher than from pharmacists.

Conclusion: We found a considerable percentage of elderly patients did not have sufficient and safe knowledge to the use their prescribed medications. Physicians and pharmacists should strive to educate patients more fully about proper medication use and understand their difficulties.

Introduction

Awareness of drug use is a crucial point where it effects the adherence to the regimen and the vulnerability to side effects, especially in elderly patients as they have greater need for prescription drugs because of worse general health, higher disability rates, and a higher prevalence of chronic diseases.(1-6) In 1995 a study done in the United States showed approximately 85 percent of the non-institutionalized elderly had at least one prescription.(5) Although the elderly only account for one-eighth of the total population, their drug expenditures account for one-third of all drug expenditures in the United States.(7)

However, as elderly patients use more medications, the risk of adverse events such as drug-drug or drug-disease interactions will increase, which is associated with more morbidity and mortality rates. According to the Institute of Medicine (IOM) " more than 2 million serious adverse drug events and about 100,000 deaths occur annually due to medication problems".(8)

Raising awareness of the characteristics of those elderly subjects most likely to be exposed to poly-pharmacy, in conjunction with studies describing the risks associated with increased medication use, may help to ensure safe, effective and appropriate use of medications in the elderly.(9)

Despite the number of medications, adherence to prescribed medication regimens is difficult for all patients and particularly challenging for the elderly. Medication adherence demands a working relationship between a patient or caregiver and prescriber that values open, honest discussion about medications.(10)

Physician-patient communication is considered a fundamental aspect of medical care and could affect the patient's awareness especially in understanding the treatment plan and the drug prescription in those with chronic illnesses; yet, research shows that patients commonly have difficulty in understanding medical instructions from physicians.(11,12) Physicians often use medical jargon, deliver too much information at a time, and do not confirm patients' understanding of what was discussed.(13,14) At the end of the medical encounter, patients remember less than half of what the physician tried to explain, and they may be uncertain about what steps to take next.(13,15,16)

Low health literacy contributes to the communication gap between physicians and patients.(14,17) Patients with low health literacy may have less familiarity with medical concepts and vocabulary, and they ask fewer questions. They may also hide their limited understanding out of shame or embarrassment.(18) Research shows that physicians commonly overestimate patients' literacy levels, and they rarely consider limited literacy skills in their assessment of whether patients understand what they need to do.(19,20) Furthermore, when provided information about patients' literacy levels, physicians appear ill-prepared to communicate effectively.(21) In their reports on health literacy, the American Medical Association (AMA) Ad Hoc Committee for the Council on Scientific Affairs, the National Work Group on Literacy and Health, and the Institute of Medicine each called for greater efforts to educate physicians and other health professionals about issues related to health literacy, including techniques to communicate more clearly.(22-24)

Non-adherence to a medication regimen may have multiple underlying causes, some of which may be easier to address than others. Open discussion between the pharmacist and patient regarding barriers to adequate medication adherence, followed by a multifaceted, personalized intervention to address these barriers, plays a key role in encouraging patients to adhere to the recommendations of the health care team.(25)
The consequences of medication non-compliance may not only be dangerous for patient's health, but also dramatically increase the financial cost for public health services.(26)
However, increased awareness about using medication among elderly patients is needed for better drug action and to minimize the risk of side events.(27-29)

Locally, the concentration given to this issue is less, and this gap should be narrowed in favor of elderly patients.

The aim of our study is to assess the level of awareness of elderly patients about using their medications in a proper and safe way, identify the contributive factors to that awareness, then find the most effective ways to raise that awareness.

Research Problem

Considering the health problems suffered by elderly and since they are one of the highest age groups using medications, consequently they are the most susceptible to the risk of these medications if not used properly; this problem is due to lack of sufficient awareness of the seriousness and importance of these medications.

Research questions :
Do the elderly patients have adequate awareness on using their medications?

Are there any associated factors that affect the elderly patients' awareness about using their medications?

Study Hypothesis :
It is hypothesized that 50% of the elderly patients are not adequately aware about using their medications when the awareness level is measured by answering the questionnaire.

Research Significance:
Elderly people require special care and concentration in their life issues, especially in the sensitive matters such as medical and health aspects that require high levels of understanding and care. Awareness about using medications by elderly patients is a critical health issue that has been discussed in order to define standards for health and social services to ensure high quality care for them.

Method

This was a cross-sectional study design using convenience sampling technique. A10 questions self-administered Arabic/English questionnaire was distributed to 385 elderly patients attending outpatients clinics in King Khalid University

Hospital, Riyadh, Saudi Arabia between 28 January to 12 February 2012. The sample size was calculated by using this formulae N = (Za/2)2 p(1-p) / d2 where the proportion (p) of elderly patients who are not adequately aware about using their medications is around 50%, with a 95% confidence interval of width ± 5% (that is to be within 5% of the true value). Male patients, both Saudi and non-Saudi, Arabic and non-Arabic speakers who were aged 60 and older and who have at least one prescription, were included in this study. First a pilot test was distributed to 35 respondents to measure the clarity of the questions to avoid any misunderstanding that could interfere with their answers. Illiterate patients were interviewed to help them to complete the questionnaire. The Data was entered and analysed using The Statistical Package of Social Science (SPSS) version 13. The Data collected from the questionnaires was divided according to the variables associated to the elderly patients awareness on using their medications (education levels, physician explanation, pharmacist explanation, taking the medications on time , refill, others) to find out how it could affect their awareness;also cross sectioning the education level variable with other variables was done to check its effect. P value less than 0.05 was considered statistically significant. A questionnaire with at least 10% of items left incomplete was excluded from data analysis.

Ethical concern :

Approval was taken from the college and the concern hospital departments. And informed consent had been taken from the patients. and their anonymity is assured . Also they had been given a full explanation of the study.

Results

385 male elderly patients fulfilled the inclusion criteria. They were 256 (66.5%) of study sample individuals and their age was between 60 to 70 years old. 87 (22.6%) of them were between 70 to 80 years old and 42 (10.9%) of them were above 80 years old [Table 1].

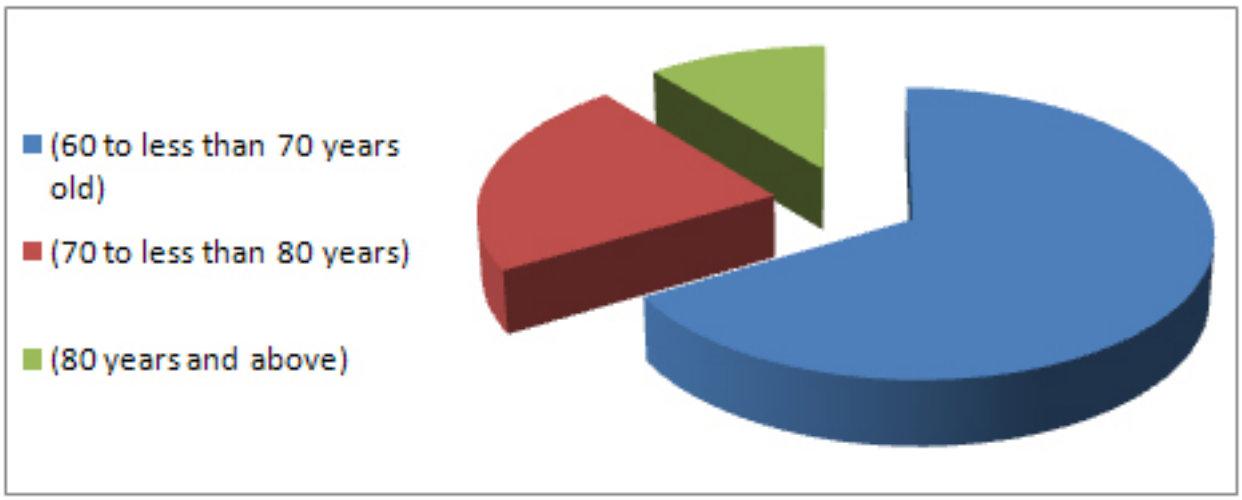
From the education level, the majority of respondents had only completed primary school 94 (24.4%), followed by 74 (19.2%) who did not know how to read and write. And 15 (3.9%) had the qualification of Doctorate Degree and they are the smallest category of study sample individuals [Table 2 - page 6].

The ten questions which assessed the awareness of elderly patients attending at King Khalid University Hospital about using their medications are placed into three answers; yes, sometimes and no. In using the medications properly question (no.1), 266 (69.1%) of the total sample answered yes, 69 (17.9%) of the total sample answered sometimes and 50 (13%) answered no. And it came in first rank in terms of agreement of study individuals on it with an average of (2.56 of 3). In the doctors and pharmacists explanation questions (nos. 2-3), the average of patients said yes in doctors questions, which was higher than the pharmacists questions with an average of (2.32 of 3). And knowing about overlapping drugs and drugs side effect questions (nos. 7-8) came in first and second ranks respectively in terms of disagreement, they were answered no by 60% and 49.6% respectively [Table 3 - page 7].

There is a positive relationship that is statically significant at level .01 and below between using the medications properly and the education level; the higher the education level the higher the respondent answering by yes [Table 4 - page 8].

Age	Frequency	Percent
(60 to less than 70 years old)	256	66.5
(70 to less than 80 years)	87	22.6
(80 years and above)	42	10.6
Total	385	100%

Table 1: Distribution of study sample individuals according to age variable



Qualification	Frequency	Percent
Illiterate	74	19.2
Primary school	94	24.2
Intermediate school	45	11.7
High school	63	16.4
Bachelor	69	17.9
Master	25	6.5
Doctorate	15	3.9
Total	385	100%

Table 2: Distribution of study sample individuals according to the education level

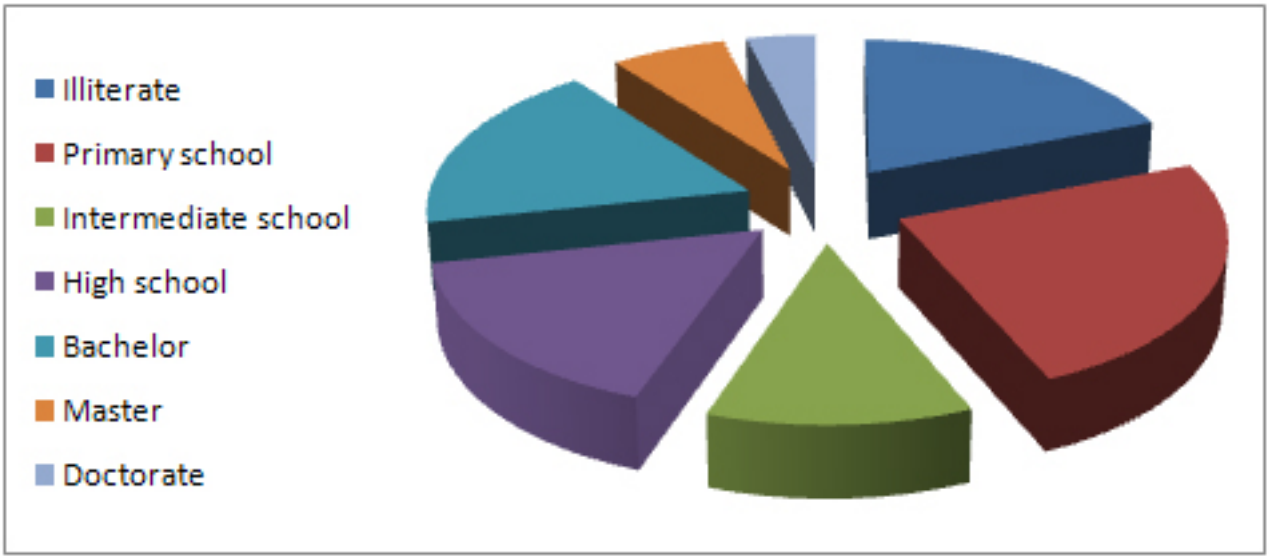


Table 5 shows how many are reading the instructions that are supplied with the medicine can be effected by the education level, as Table 5, page 8.

Discussion

In this study we investigated the awareness of elderly patients about using their medications, and the biggest factor affecting that awareness, and they revealed inadequate knowledge of the safe use of medications. In the present study we gathered 74 illiterates out of the 385 elderly patients and unfortunately36.5% of them reported that they don't know how to use the prescribed medication in a proper way. Additionally another study aimed at assessing patient knowledge about prescribed drugs showed that from 199 patients interviewed after they had received a prescription, 53.8% didn't have any information about the medicine, 20.3% didn't know the dosage and 25.4% didn't know the medication schedule. The purpose of the medication was the information with the highest percentage of correct answers, with 75.1% of the patients showing good level of knowledge. Regarding the duration of the treatment and side effects, 57.4% and 94.4% of the patients, respectively, didn't present any correct information.(30)

Recent evidence points to poor literacy as a risk factor, likely through its effect on patients' ability to understand how to follow the medication regimen. Kalichman et al(31) demonstrated that patients with lower literacy skills were less adherent to antiretroviral therapy, and this effect persisted after controlling for other variables. Low-literacy patients in that study often cited confusion about the regimen as a reason for nonadherence.(31) Other studies have shown that low-literacy patients struggle to understand medication instructions. In a survey of Medicare managed care enrollees, Gazmararian et al(32) found that 47.5% with inadequate literacy skills incorrectly described the timing of medication doses when looking at a pill bottle, compared with 24.4% of those with marginal,

ser	Item	Frequency	Agree			Mean	Std. Deviation
		Percent%	Yes	Sometimes	No		
1	Do you know how to use the medication in its proper way?	F	266	69	50	2.56	0.712
		%	69.1	17.9	13.0		
2	Did you receive any explanation about using the medication from the physician?	F	209	91	85	2.32	0.813
		%	54.3	23.6	22.1		
3	Did you receive any explanation about using the medication from the pharmacist?	F	180	83	122	2.15	0.874
		%	46.8	21.6	31.7		
4	Did you take care to read the instructions labeled with the medications or ask someone to read it for you?	F	129	62	193	1.83	0.901
		%	33.5	16.1	50.4		
5	Do you care to know the purpose of the prescribed medication?	F	251	55	79	2.45	0.812
		%	65.2	14.3	20.5		
6	Do you care to take the medication regularly and on time ?	F	189	104	92	2.25	0.817
		%	49.1	27.0	23.9		
7	Do you care to know the side effects of the prescribed medication?	F	107	87	191	1.78	0.853
		%	27.8	22.6	49.6		
8	Do you care to know if there is an overlap between the drugs when used at the same time ?	F	86	68	231	1.62	0.827
		%	22.3	17.7	60.0		
9	Do you care to tell the physician about any medications you used before ?	F	220	83	82	2.36	0.811
		%	57.1	21.6	21.3		
10	Do you care to refill your medications as soon as they finished?	F	245	75	65	2.47	0.767
		%	63.6	19.5	16.9		

Table 3: Study individuals responded to the ten questions which assessed their awareness on using their medications

and 11.5% of those with adequate literacy skills. Similarly, 54.3% of respondents with inadequate literacy skills could not describe how to take medication on an empty stomach, compared with 33.7% and 15.6% of those with marginal and adequate literacy skills, respectively.(32) In another study the medication management capacity was significantly associated with literacy (P<.001), and this effect was driven by the ability to identify medications. In multivariable models, patients with inadequate literacy skills had 10 to 18 times the odds of being unable to identify all of their medications, compared with those with adequate literacy skills (P<.05).(33)

These published findings, combined with results of our investigation, suggest that awareness is highly affected by inadequate literacy skills as it has an impact on the patients' ability to manage medications, and prevents them from understanding how to take the medications and be aware of their side events. Additional research is needed to investigate the relationship between literacy and medication use, with attention to mediating and moderating factors.

Three levels of awareness were identified. Patients at the First Level did not know the purpose or possible side effects of their medication; those at the Second Level knew the names and main side effects and relied on doctors to provide detailed information. Patients at the Third Level understood their diagnosis and were committed to finding out about their illness.(34) As in the first level a study done in Egypt showed that more than 30% of the patients reported that they did not know the purpose of at least one of their drugs and only read package inserts (PIs) selectively. Whereas 36% read about drug interactions, more reported reading about side effects (65%) and contraindications (60%) in Patient Information Leaflets. Sixty-nine per cent of patients reported that they needed more information about their drugs.(35) Another study done on patients taking non-steroidal anti-inflammatory drugs demonstrated that 35.5% of the patients were aware

LEVEL		Using medication properly			Total
		No	Sometimes	Yes	
Illiterate	Count	27	18	29	74
	% within LEVEL	36.5%	24.3%	39.2%	100.0%
Primary school	Count	8	24	62	94
	% within LEVEL	8.5%	25.5%	66.0%	100.0%
Intermediate school	Count	3	11	31	45
	% within LEVEL	6.7%	24.4%	68.9%	100.0%
High school	Count	6	6	51	63
	% within LEVEL	9.5%	9.5%	81.0%	100.0%
Bachelor	Count	4	5	60	69
	% within LEVEL	5.8%	7.2%	87.0%	100.0%
Master	Count	1	5	19	25
	% within LEVEL	4.0%	20.0%	76.0%	100.0%
Doctorate	Count	1		14	15
	% within LEVEL	6.7%		93.3%	100.0%
Total	Count	50	69	266	385
	% within LEVEL	13.0%	17.9%	69.1%	100.0%
P value					0.000**

Table 4: The association between the education level and using the medications properly among the elderly patients attending at King Khalid University Hospital

LEVEL		Reading the instructions			Total
		No	Sometimes	Yes	
Illiterate	Count	55	11	8	74
	% within LEVEL	74.3%	14.9%	10.8%	100.0%
Primary school	Count	60	13	21	94
	% within LEVEL	63.8%	13.8%	22.3%	100.0%
Intermediate school	Count	23	12	10	45
	% within LEVEL	51.1%	26.7%	22.2%	100.0%
High school	Count	24	12	27	63
	% within LEVEL	38.1%	19.0%	42.9%	100.0%
Bachelor	Count	17	11	41	69
	% within LEVEL	24.6%	15.9%	59.4%	100.0%
Master	Count	9	1	15	25
	% within LEVEL	36.0%	4.0%	60.0%	100.0%
Doctorate	Count	6	2	7	15
	% within LEVEL	40.0%	13.3%	46.7%	100.0%
Total	Count	194	62	129	385
	% within LEVEL	50.4%	16.1%	33.5%	100.0%
Chi-Square Tests					38.352
Asymp. Sig. (2-sided)					0.000**

Table 5: The association between the education level and reading the instructions that are supplied with the medicine among the elderly patients attending at King Khalid University Hospital

of side effects of non-steroidal anti-inflammatory drugs. 85.4% and 11.5% were aware of the gastrointestinal and other system-related side effects, respectively. 51% had learned of the side effects from doctors, 19.8% received information from the package inserts, 21.3% had experienced side effects, and 10.0% and 0.8% had learned from their friends and pharmacist, respectively.(36) The present study showed that out of the 385 patients 20.5% reported that they don't care about knowing the purpose of the prescribed medications, whereas 14.3% said that they sometimes ask about the purpose. And when they were asked if they care to know the possible side effects of the prescribed medications 49.6% said no.

From the previous studies and our study we notice that there is a considerable percentage of elderly patients who are not aware about the side effect which brings us to shed some light on the sources for the information about side effects the patients can get, which we expect to be the main problem and that can be illustrated by this study. One hundred and fifty four patients were interviewed to determine the type and source of information that they had received about drugs that had been prescribed for them. Most had been told how often to take the drugs (145 (94%)) and how much to take each time (143 (93%)), but few had been informed about side effects (49 (32%)) and fewer had received written information (22 (14%)).(37)

The most reliable source for the medication information is physician and pharmacist,(38-39) especially the physician who has an essential role to educate and raise the awareness of the patients about using their medication,(11,12) and the higher the physician-patient concordance the higher the medication compliance.(40) Some evidence suggests that education by health care professionals especially physicians, improves patients' understanding of their medication,(41-52) and it is also important that physicians be aware of the elderly patients' difficulties to establish better communication.(22-24) In our study the patients had been asked if they received explanations form the physician and the pharmacist about using their medications and 20% said that they didn't receive any explanations from their physicians whereas 31% said that they didn't receive any explanations from the pharmacist.

A study investigated the education role of physicians and pharmacists and the greatest barriers they face doing it, and it showed that forty-seven respondents with a mean age of 77.1 years reported that physicians spent a mean of 10.5 minutes (range, 0-60 minutes) and pharmacists spent a mean of 5.3 minutes (range, 0-40 minutes) providing medication education. Fifty-one percent reported receiving no education from either physician or pharmacist, and only 30% reported receiving written medication instructions.(53) Physicians identified one or more barriers to providing education 51% of the time and pharmacists 80%. Lack of time was the most common barrier.(53)

Adherence to the medications is so much effected by awareness especially in chronic diseases. A recent national survey found that during the previous 12 months, 30% of patients took prescription medications less often than prescribed, 26% delayed filling a prescription, 21% stopped taking a prescription sooner than prescribed, 18% never filled a prescription, and 14% took smaller doses than prescribed.(54) Prior research has shown that only 50% to 60% of patients are adherent with taking prescribed medications over a 1-year period.(55-57) Non-adherence is an important public health issue, particularly in chronic disease management. It costs an estimated $100 billion annually in the United States and accounts for 10% of hospital admissions.(57)

Lack of awareness is a serious public health problem where its effect ranges from small injuries to patient death and has been discussed in order to define standards for health and social services to ensure high quality care especially for elderly patients.

Conclusion and Recommendations

We found a considerable percentage of elderly patients did not have sufficient and safe knowledge on the use of their prescribed medications. The present investigation adds to the growing body of evidence, suggesting that inadequate awareness may be an important risk factor for poor comprehension and medication mismanagement. Physicians and pharmacists should strive to educate patients more fully about proper medication use and understand their difficulties. Further community based research is recommended to evaluate elderly patients' awareness about using their medications in the Saudi Community.

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References

1. Adams AS, Soumerai SB, Ross-Degnan D. The case for a medicare drug coverage benefit: a critical review of the empirical evidence. Annu Rev Public Health.2001;22:49-61. Review. PubMed PMID: 11274510.
2. Blustein J. Drug coverage and drug purchases by Medicare beneficiaries with hypertension. Health Aff (Millwood). 2000 Mar-Apr;19(2):219-30. PubMed PMID: 10718036.
3. Johtison, Richard E.. Michael Goodman, Mark Hornbook, and Michael Eldredge. 1997. "The Impact of Increasing Patient Prescription Drug Cost-Sharing on Therapeutic Classes of Drugs Received and on the Health Status of Elderly HMO Members." Health Services Research 32(l):103-22.
4. Lillard. Lee. Jeanette Rogowski, and Raynard Kington. 1999. "Insurance Coverage for Prescription Drugs: Effects on Use and Expenditures in the Medicare Population." Medical Care 37(3):926-36.
5. Poisal John, Lauren Murray, George Chuiis, and Barbara Cooper. 1999. "Prescription Drug Coverage and Spending for Medicare Beneficiaries." Health Care Financing Review 20(3):15-25.
6. Rogowski, Jeanette, Lee Lillard, and RaynardKington. 1997. "The Financial Burdens of Prescription Drug Use among Elderly Persons." Gerontologist 37(4):475-82.
7. Long, Scott. 1994. "Prescription Drugs and the Elderly: Issues and Options." Health Affairs 13(2): 157-74.

8. Center for Technology and Aging, editor. Technologies for Optimizing Medication Use in Older Adults [monograph on the internet]. San Francisco: Center for Technology and Aging; 2011 [cited 2011 Oct 18]. Available from: http://www.techandaging.org/MedOpPositionPaper.pdf
9. Slabaugh SL, Maio V, Templin M, Abouzaid S. Prevalence and risk of polypharmacy among the elderly in an outpatient setting: a retrospective cohort study in the Emilia-Romagna region, Italy. Drugs Aging. 2010 Dec 1;27(12):1019-28.
10. MacLaughlin EJ, Raehl CL, Treadway AK, Sterling TL, Zoller DP, Bond CA. Assessing medication adherence in the elderly: which tools to use in clinical practice? Drugs Aging. 2005;22(3):231-55. Review. PubMed PMID: 15813656.
11. Weiss BD, Reed RL, Kligman EW. Literacy skills and communication methods of low-income older persons. Patient EducCouns. 1995;25:109-19. [PubMed]
12. Gibbs R, Gibbs P, Henrich J. Patient understanding of commonly used medical vocabulary. J FamPract. 1987;25:176-8. [PubMed]
13. Ong LM, de Haes JC, Hoos AM, Lammes FB. Doctor-patient communication: a review of the literature. SocSci Med. 1995;40:903-18. [PubMed]
14. Schillinger D, Bindman AB, Wang F, Stewart AL, Piette J. Functional health literacy and the quality of physician-patient communication among diabetes patients. Patient EducCouns. 2004;52:315-23. [PubMed]
15. Calkins DR, Davis RB, Reiley P, et al. Patient-physician communication at hospital discharge and patients' understanding of the postdischarge treatment plan. Arch Intern Med. 1997;157:1026 -30. [PubMed]
16. Makaryus AN, Friedman EA. Patients' understanding of their treatment plans and diagnosis at discharge. Mayo Clin Proc. 2005;80:991-4. [PubMed]
17. Weiss BD, Coyne C. Communicating with patients who cannot read. N Engl J Med. 1997;337:272-4. [PubMed]
18. Parikh NS, Parker RM, Nurss JR, Baker DW, Williams MV. Shame and health literacy: the unspoken connection. Patient EducCouns. 1996;27:33-9. [PubMed]
19. Bass PF, III, Wilson JF, Griffith CH, Barnett DR. Residents' ability to identify patients with poor literacy skills. Acad Med. 2002;77:1039-41. [PubMed]
20. Powell CK, Kripalani S. Resident recognition of low literacy as a risk factor in hospital readmission. J Gen Intern Med. 2005;20:1042-4. [PMC free article] [PubMed]
21. Seligman HK, Wang FF, Palacios JL, et al. Physician notification of their diabetes patients' limited health literacy. A randomized, controlled trial. J Gen Intern Med. 2005;20:1001-7. [PMC free article] [PubMed]
22. American Medical Association Council on Scientific Affairs. Health literacy. JAMA. 1999;281:552-7. [PubMed]
23. Institute of Medicine. Health Literacy. A Prescription to End Confusion. Washington, DC: National Academies Press; 2004.
24. National Work Group on Literacy and Health. Communicating with patients who have limited literacy skills. J FamPract. 1998;46:168-76. [PubMed]
25. Bubalo J, Clark RK Jr, Jiing SS, Johnson NB, Miller KA, Clemens-Shipman CJ, Sweet AL. Medication adherence: pharmacist perspective. J Am Pharm Assoc (2003). 2010 May-Jun;50(3):394-406. Review. PubMed PMID: 20452915.
26. Scheen AJ. [Medication compliance]. Rev Med Liege. 1999 Nov;54(11):854-8.French. PubMed PMID: 10667043.
27. Hines LE, Murphy JE. Potentially Harmful Drug-Drug Interactions in the Elderly: A Review. Am J GeriatrPharmacother. 2011 Nov 10
28. Blower P, de Wit R, Goodin S, Aapro M. Drug-drug interactions in oncology: why are they important and can they be minimized? Crit Rev OncolHematol. 2005 Aug;55(2):117-42. Review. PubMed PMID: 15890526.
29. Herrlinger C, Klotz U. Drug metabolism and drug interactions in the elderly. BestPract Res ClinGastroenterol. 2001 Dec;15(6):897-918. Review. PubMed PMID: 11866484.
30. Portela Ada S, Simões MO, Fook SM, Montenegro Neto AN, da Silva PC. [Medical prescriptions: adequate orientation to medicine use?]. CienSaude Colet. 2010 Nov;15 Suppl 3:3523-8. Portuguese. PubMed PMID: 21120340.
31. Kalichman S, Ramachandran B, Catz S. Adherence to combination antiretroviral therapies in HIV patients of low health literacy. J Gen Intern Med. 1999;14:267-73. [PMC free article] [PubMed]
32. Gazmararian JA, Baker DW, Williams MV, et al. Health literacy among Medicare enrollees in a managed care organization. JAMA. 1999;281:545-51. [PubMed]
33. Kripalani S, Henderson LE, Chiu EY, Robertson R, Kolm P, Jacobson TA. Predictors of medication self-management skill in a low-literacy population. J Gen Intern Med. 2006 Aug;21(8):852-6. PubMed PMID: 16881946; PubMed Central PMCID: PMC1831567.
34. Field K, Ziebland S, McPherson A, Lehman R. 'Can I come off the tablets now?'A qualitative analysis of heart failure patients' understanding of their medication. FamPract. 2006 Dec;23(6):624-30. Epub 2006 Jul 11. PubMed PMID: 16837480.
35. Amin ME, Chewning BA, Wahdan AM. Sources of drug information for patients with chronic conditions in Alexandria, Egypt. Int J Pharm Pract. 2011 Feb;19(1):13-20. doi: 10.1111/j.2042-7174.2010.00069.x. Epub 2010 Nov 4. PubMed PMID: 21235655.
36. Yilmaz H, Gürel S, Ozdemir O. Turkish patients with osteoarthritis: their awareness of the side effects of NSAIDs. Turk J Gastroenterol. 2005 Jun;16(2):89-92. PubMed PMID: 16252199.
37. McMahon T, Clark CM, Bailie GR. Who provides patients with drug information? Br Med J (Clin Res Ed). 1987 Feb 7;294(6568):355-6. PubMed PMID: 3101874; PubMed Central PMCID: PMC1245360.
38. Ho CH, Ko Y, Tan ML. Patient needs and sources of drug information in Singapore: is the Internet replacing former sources? Ann Pharmacother. 2009 Apr;43(4):732-9. Epub 2009 Mar 24. PubMed PMID: 19318597
39. Närhi U. Sources of medicine information and their reliability evaluated by medicine users. Pharm World Sci. 2007 Dec;29(6):688-94. Epub 2007 May 4. PubMed PMID: 17479353.
40. Kerse N, Buetow S, Mainous AG 3rd, Young G, Coster G, Arroll B.-patient relationship and medication compliance: a primary care investigation. Ann Fam Med. 2004 Sep-Oct;2(5):455-61. PubMed PMID: 15506581; PubMed Central PMCID: PMC1466710.

41. Baker DM. A study contrasting different modalities of medication discharge counseling. Hosp Pharm. 1984;19: 545 - 54.PubMed, CAS
42. Cole P, Emmanuel S. Drug consultation: its significance to the discharged hospital patient and its relevance as a role for the pharmacist. Am J Hosp Pharm. 1971;28: 954 - 60.PubMed, CAS, Web of Science® Times Cited: 61
43. De Young M. Research on the effects of pharmacist-patient communication in institutions and ambulatory care sites, 1969-1994.Am J Health Syst Pharm. 1996;53: 1277 - 91PubMed, Web of Science® Times Cited: 30
44. German PS, Klein LE, McPhee SJ, Smith CR. Knowledge of and compliance with drug regimens in the elderly. J Am Geriatr Soc. 1982;30: 568 - 71.PubMed, CAS, Web of Science®
45. Hulka BS, Cassel JC, Kupper LL, Burdette JA. Communication, compliance, and concordance between physicians and patients with prescribed medications. Am J Public Health. 1976;66: 847 - 53.CrossRef, PubMed, CAS, Web of Science®
46. McBean B J, Blackburn JL. An evaluation of four methods of pharmacist-conducted patient education. Can Pharm J. 1982; 115: 167 - 72.PubMed, CAS
47. O'Connell MB, Johnson JF. Evaluation of medication knowledge in elderly patients. Ann Pharmacother. 1992;26: 919 - 21.PubMed, CAS, Web of Science® Times Cited: 29
48. Wandless I, Davie JW. Can drug compliance in the elderly be improved? BMJ. 1977;1: 359 - 61.CrossRef, PubMed, CAS, Web of Science®
49. Moore SR, Kalu M, Yavaprabbas S. Receipt of prescription drug information by the elderly. Drug IntellClin Pharm. 1983;17: 920 - 3.PubMed, CAS, Web of Science® Times Cited: 25
50. Woroniecki CL, McKercher PL, Flagler DG, Berchou R, Cook JA. Effect of pharmacist counseling on drug information recall. Am J Hosp Pharm. 1982;39: 1907 - 10.PubMed, CAS, Web of Science® Times Cited: 20
51. Gryfe CI, Gryfe BM. Drug therapy of the aged: the problem of compliance and the roles of physicians and pharmacists. J Am Geriatr Soc. 1984;32: 301 - 7.PubMed, CAS, Web of Science®
52. Ascione FJ, Shimp LA. The effectiveness of four education strategies in the elderly. Drug IntellClin Pharm. 1984;18: 926 - 31.PubMed, CAS, Web of Science® Times Cited: 44
53. Alibhai SM, Han RK, Naglie G. Medication education of acutely hospitalized older patients. J Gen Intern Med. 1999 Oct;14(10):610-6. PubMed PMID: 10571706; PubMed Central PMCID: PMC1496747.
54. The Boston Consulting Group. The hidden epidemic: finding a cure for unfilled prescriptions and missed doses; 2003: Available at: http://www.bcg.com/publications/publications_splash.jsp.
55. Haynes RB, Yao X, Degani A, Kripalani S, Garg A, McDonald HP. Interventions to enhance medication adherence. Cochrane Database of Systematic Reviews. 2005;(4)
56. Osterberg L, Blaschke T. Adherence to medication. N Engl J Med. 2005;353:487-97. [PubMed]
57. Vermeire E, Hearnshaw H, Van Royen P, Denekens J. Patient adherence to treatment: three decades of research. A comprehensive review. J Clin Pharm Ther. 2003;26:331-42. [PubMed]

Original Contribution/Clinical Investigation

Mental and physical health status among elderly people: The role of socioeconomic predictors

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ABSTRACT

Objectives: Socio-economic differences influence mental disorders and poor health functioning. The aim of the present study was to examine socioeconomic (SES) inequalities in the incidence of mental and physical disorders in old people.

Method: The participants of the study were Iranian elderly aged 60+years living in Tehran. The survey included questions on SES, mental health measures (K6 and psychological wellbeing) and physical health measures (Activity of Daily Living (ADL), SF-36) which were drawn from the New South Wales Older People Survey 1999.

Results: A total of 402 elderly participated. The largest age grouping were aged 60 to 69 (45%); 46% were illiterate; 55% had no financial support; 16% had no Medicare and private health insurance. High levels of anxiety and depressive symptoms were found in 11%, and 46.5% had a moderate level of distress. Almost a third had difficulty in physical functioning (SF-36), indicating a severe limitation. With regard to ADL, 18.2% of the elderly participants indicated a high need of supervision.

Conclusion: Our results highlight the potential importance of current economic conditions in undermining mental health. Findings of the study suggest that financially supporting elderly who are facing everyday economic difficulties is likely to be beneficial for their mental and physical health.

Key words: Elderly, Socioeconomic status, Mental disorders, Physical function, ADL

Introduction

Age is one of the main factors determining the level of an individual's health and social needs. The elderly population's health is affected by different economic, social and political aspects. Demographic components such as age, socioeconomic conditions, gender, and marital status all affect the health status of the elderly [1]. The differences of gender, socioeconomic status (SES), and geographic region have been examined for their effects on health status in the elderly [2]. Research has shown that [3] that the Iranian populations living in both Tehran and Stockholm reported depressive symptoms. Self-reported depressive symptoms were reported to a greater extent in women compared to men. The physical health status of the elderly in Iran, using the Short Form Health Survey (SF-36), indicated that elderly people living in Tehran suffer from relatively poor quality of life; particularly elderly women and those with lower education. Economic status also was a significant determinant of poorer mental health-related quality of life [4]. Low SES is associated with an increase in morbidity and mortality, and is an important component of poor health functioning [5]. SES differences also affect mental disorders such as anxiety and depression [6], with low SES being associated with a higher prevalence and incidence of depression [7]. Depression is a common disorder in the elderly with negative outcomes in well-being and activities of daily living functions [8], and in addition, anxiety and physical health conditions significantly affect their quality of life [9]. Prevalence rates of anxiety disorders in older adults are estimated to be between 3.2% and 14.2% [10], and clinical research suggests that a significant proportion of the elderly with anxiety disorders are at increased risk of medical conditions and disability [11]. In order to decrease depression rates and the SES differences in older people, it is important to unpack and examine the association between SES and depression. This may help to provide tools for prevention and intervention strategies. Psychosocial aspects as well as physical health status may be essential in understanding SES inequalities in depressive symptoms [12, 13]. People with low SES usually have less psychosocial and social support compared with people of high SES [14]. The associations between psychosocial aspects and depression have been studied broadly [15]. A study has found a positive effect of social support on mental health [8].

It has been suggested that retirement may be a main social feature contributing to a reduction in mental health in the elderly. It is assumed that the loss of responsibility and the minimization of social contact following retirement can lead to depression [16]. Stressful events have a harmful impact on mental health status [15] and physical health status may also be pertinent in understanding the SES differences in depressive symptoms. Low SES is a risk factor for many chronic diseases, including cardiovascular disease, stroke, and diabetes [6, 17], which in turn are associated with increased psychological symptoms [18]. Additionally, low SES is also a strong predictor of poor physical limitation in the elderly [19, 20], for which physical limitations should also be taken into account in the explanation of SES differences in depressive symptoms. Low SES is a strong predictor of poor physical functioning in the elderly, which is sequentially a predictor of depression [21, 22].

The aim of the present study was to examine whether demographic and socioeconomic differences predict the physical and mental health status of older people living in Tehran.

In this study, several SES components are used as explanatory factors in order to understand differences in psychosocial well-being, anxiety and depression, ADL, and physical functioning status of the Iranian elderly.

Methods

Subjects were drawn from the population registers in public health centers in the Tehran metropolitan area in 2011, and then a random sample of Iranian older adults 60+ was selected from the register lists of participants visiting public health centers. By simple randomized sampling allocation, 420 elderly participants were interviewed. Our analyses were restricted to participants who were aged 60 years or older to enhance statistical power, and due to the fact that the traditional age cutoff of 65 years is found increasingly irrelevant in the case of Iranian elderly who often retire significantly earlier than 65 years.

Respondents whose cognitive or mental health prevented them from responding were excluded from the interview. Both face to face and telephone interviews were conducted by trained interviewers. Two interviewers were recruited who were university students or graduates. The interviewers were trained by the first author (MAZ) in three weekly meetings.

Questions used in the study were drawn from the NSW 1999 Older People Survey. [23, 24] The survey underpinning the current study included a variety of demographic measures in addition to 'closed-ended' and multiple-choice questions about mental and physical health. The questionnaire was translated into Farsi (the native language of most Iranians) in line with guidelines for cross-cultural adaptation of self-report measures [25]. Data were self-reported, except when respondents were physically incapable of responding for themselves. The mean duration of the interviews was 54 minutes each. The research was approved by the Ethics Committee for Research on Human Beings of the Federal University of Tehran.

1.1. Study measures

Questions captured respondents' socio-demographic characteristics. The survey asked 'closed-ended' and multiple-choice questions on mental health measures (K6 as defined by Kessler, 2003 and psychological wellbeing, 2006) and physical health measures (physical functioning/SF-36, ADL).

1.1.1. Sociodemographic variables

Sociodemographic variables in this study included age, gender, level of education, marital status, living situation, number of children, job status, source of income, income satisfaction, and home ownership. We assessed age continuously and categorized both marital status (married/ common law, widowed, separated/divorced and never married) and level of education (illiterate, less than secondary school, secondary school graduate/no postsecondary education, some postsecondary education and postsecondary degree/diploma). We categorized job status into four groups (employee, retirement, household, and

jobless) and income satisfaction into three groups (Yes, No, and "so-so").

1.1.2. Mental disorders

Mental health of the participants was assessed on two components: psychological distress and well-being. Psychological distress was assessed using the Kessler K6 measure (New South Wales Department of Health, 2000). Six questions were used to measure anxiety and depressive symptoms that participants may have experienced in the four weeks prior to interview [26]. Participants were asked "During the last four weeks, how much of the time did you feel sad, nervous, restless, hopeless, effort, worthless?" Scores for the six items were summed for each participant, yielding a score ranging from 6 to 30 [26]. A lower scale score means higher psychological distress and a higher score means lower psychological distress. Inter-item correlation of K6 was significant at $P < .001$ levels, Cronbach's Alpha .803, Mean = 20.42, SD = 5.67, Reliability a = .95, and 95% Confidence Intervals. The distribution of responses on all the indices were used in this study as the K6 was found to be a strong index for the study group (Cronbach's Alpha = 0.803).

Psychological wellbeing was assessed using five questions that asked how often the respondent felt happy, calm/peaceful, bored, lonely, and depressed during the previous four weeks. Responses were entered on a three-point scale: (3) 'most of the time'; (2) "some of the time" and (1) "none of the time". Scores for items with negative emotions (bored, lonely, and depressed) were reversed. The raw score was derived by summing responses to all five questions (after reversing scores for the three negative emotion questions) producing a score range of 5 to 15. The lower the scale score, the lesser the strength of well-being reported. This well-being scale was also found to be a strong index for the study group (Cronbach's Alpha = 0.801). Inter items correlation was significant at $P < .001$ levels, Cronbach's Alpha .801, Mean = 10.42, SD = 2.48, Reliability a = .95, and 95% CI.

1.1.3. Physical health conditions

Physical health of the participants was assessed using two measures: the short form of SF-36 and Activities of Daily Living (ADL). The short form 36 questions Health Survey (SF-36) measures different aspects of health [23]. Only the physical functioning dimension of the SF-36 was included in this study. The physical functioning scale comprises questions concerning a person's ability to do various activities. There are 20 questions of SF-36. Answers to the 10 questions concerning "health limited a lot", "a little" and "not at all" to do various moderate and vigorous activities; the remaining ten asked about the extent of limitation. The scores were summed and the total is presented as a score out of 30. Higher scores indicate better physical functioning as no limitation, and lower scores indicate poorer physical functioning as a high limitation. Inter-items' correlation was significant at $P < .001$ levels, Cronbach's Alpha .918, Mean = 22.02, SD = 5.75, Reliability a = .95, and 95% CI.

The capacity of the individual to perform ADL is the key criterion for long-term care. If a person cannot take care of themselves, due to any type of physical or mental problems, then that person will require care from another person [23]. To measure ADL conditions, the survey asked about the participant's capability to conduct household duties. For each item, there is a two-level response scale (Yes or No) based on the participant's capability to conduct ADL themselves or whether they need supervision. Answers to the five questions were scored, summed and the total presented as a score out of 5. Higher scores indicate less need of supervision or help with their ADL, and lower scores indicate high need of supervision with their ADL. Inter-items' correlation is significant at $P < .001$ levels, Cronbach's Alpha, .852, Mean = 3.42, SD = 1.58.

Data analysis

T-test and one-way ANOVA were computed among the independent and the dependent variables e.g., K6, physiological wellbeing, short form (SF-36) and ADL. Inter-item correlations and internal consistency of all scales were computed, and the reliability of each scale was tested using Cronbach's alpha. To examine differences in sociodemographic characteristics, bivariate analyses using Chi-square tests were conducted. To examine sociodemographic differences in each of the four indicators of health status stratified by three groups of older adults (60-69, 70-79, 80+), multivariate analyses using logistic regression were conducted. Adjustments were made for gender, marital status, education, job status, source of income, and income satisfaction in multivariable analyses. Only variables with a statistically significant ($P< 0.01$; $P< 0.05$) linear regression coefficient were retained in the final multiple regression analysis model. The data were analysed using SPSS V18.0 for Windows.

Results

A total of 402 elderly participants completed the survey. The largest age grouping were participants aged 60 to 69 (45%); 36.3% were 70-79; and 18.7% were 80 or older. About half of participants were male (57%,) and over half (64%) were married; and 16% lived alone. Nearly half (46%) were illiterate which was about double in older female population. More than half of the elderly participants (55%) had no financial support (retirement wage or pension payment). Seventy-five percent of participants were not satisfied with their financial situation. Yet the majority (69%) of respondents were home-owners. Most of the sample (87%) relied on a government health care subsidy for the elderly. Only 15% of elderly participants in this study had private health insurance.

Anxiety and depressive symptoms, based on responses to the Kessler/ K6, were found in the majority of participants; 11% had a high level of distress, 46.5% had a moderate level of distress, and 41.7 % had low distress levels. In the four weeks prior to completing the survey, less than half of the respondents (43%) were rated in the moderate level of physiological wellbeing; 17 % had no feeling of wellbeing; and 40% indicated a high level of physiological wellbeing. On the individual measures of wellbeing, 29.4% reported feeling lonely, 38.2% reported feeling bored; 48.4% reported not feeling depressed at all; only 23% of respondents reported feeling happy; and 20.6 % reported never feeling calm and peaceful at all.

Table 1: Regression model of mental health status-Anxiety/Depression disorders (K6) and socio-demographic predictors' differences

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	Baseline	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)		23.663	1.476		16.030	.000	20.760	26.565
Private Health insurance	Yes							
No		.048	.862	.003	.055	.956	-1.647	1.742
Don't know		-6.458	2.073	-.157	-3.115	.002	-10.535	-2.382
Sex	Male	-1.970	.721	-.152	-2.731	.007	-3.389	-.552
Age	60-70							
70-80 years old		1.755	.687	.132	2.555	.011	.405	3.106
80-90 years old		-.550	.875	-.033	-.629	.530	-2.270	1.170
Education	Illiterate							
Primary		-.150	.710	-.011	-.211	.833	-1.546	1.246
High school & diploma		1.947	1.054	.100	1.848	.065	-.124	4.019
University degrees		-.061	1.807	-.002	-.034	.973	-3.615	3.492
Employment	Employee							
Retirement wage		-.509	.953	-.036	-.534	.594	-2.383	1.366
jobless		-1.924	.933	-.150	-2.063	.040	-3.759	-.090
Housing	Home owner							
Paying rent		-2.345	.922	-.124	-2.544	.011	-4.158	-.533
Home children		-.835	.942	-.046	-.887	.376	-2.688	1.017
Home family		-2.371	1.905	-.061	-1.245	.214	-6.117	1.374
Other		-3.736	3.066	-.058	-1.218	.224	-9.765	2.293
Money satisfaction	Yes							
No		-1.852	.905	-.142	-2.047	.041	-3.631	-.073
So so		-.341	1.011	-.023	-.337	.736	-2.329	1.647

Table 2: Regression model of mental health status- Physiological wellbeing (Yield) and socio-demographic predictors' differences (p 16 & 17)

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	Baseline	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)		10.563	.703		15.026	.000	9.181	11.945
Private health insurance	Yes							
No		-.231	.369	-.033	-.625	.532	-.956	.495
Don't know		1.351	.942	.077	1.434	.152	-.501	3.204
Housing	Home owner							
Paying rent		-.034	.412	-.004	-.082	.935	-.844	.776
Home children		.791	.452	.102	1.749	.081	-.098	1.681
Home family		-.269	.875	-.016	-.308	.759	-1.990	1.451
Other		3.210	1.392	.117	2.305	.022	.472	5.947
Money satisfaction	Yes							
No		.580	.411	.104	1.411	.159	-.228	1.389
So so		-.515	.449	-.083	-1.147	.252	-1.397	.368
Source of money	Employee							
Private property		-.498	.596	-.054	-.836	.404	-1.670	.674
Retirement wage		-.178	.457	-.033	-.389	.697	-1.075	.720
Charity		-.730	.765	-.057	-.954	.341	-2.234	.775
Child sponsor		.554	.544	.078	1.019	.309	-.515	1.623
Other		-.197	.669	-.018	-.295	.768	-1.512	1.117

Living with who in house	No-one/alone									
Only husband/wife		.075	.459	.011	.163	.870	-.828	.978		
Husband/wife & children		-.265	.418	-.048	-.633	.527	-1.086	.557		
Only children		-.879	.480	-.120	-1.829	.068	-1.824	.066		
Sisters & brothers & family		1.730	1.023	.089	1.691	.092	-.281	3.741		
Friends & neighbors		2.088	1.991	.054	1.049	.295	-1.826	6.002		

Difficulties in physical functioning/SF-36 were common among survey participants: 29.6% had severe limitations; 32.6% had moderate limitations; and 37.8% had no limitation in physical functioning. On the individual measures of physical functioning, 79.4% of Iranian elderly suffered limitations in doing vigorous activities such as running, lifting heavy objects or participating in strenuous sport; whilst a considerable number (57.5%) had moderate limitation in doing activities such as moving a table, pushing a vacuum cleaner; lifting or carrying groceries (59.7%); and about three quarters (76.5%) of elderly had a health limit in climbing several flights of stairs. 55.5% respondents had physical functioning limitation in walking more than one kilometre or about half a mile, followed by a limitation in bending, kneeling or stooping (70.4%).

More than half of the respondents (59.5%) had ADL scores indicating a low need for supervision or help with their ADL; 22.3% had a moderate need for help or supervision; and 18.2% had high need supervision in their daily living activities. With respect to individual activities, 61% reported they could perform household duties by themselves; 77% reported that they could prepare their own meals; and 67% of respondents could do their home maintenance or gardening. Only 31% of the respondents claimed to need help or supervision with personal care such as showering or bathing, dressing, toileting; 32% reported the need for help with cutting their toenails.

A series of univariate analyses was carried out, followed by liner and multiple regression analyses. Tables 1 and 2 show the association between socio-demographic indicators and mental health variables (K6 and psychological wellbeing). Of the SES factors age, employment, housing, and money satisfaction were significant predictors of anxiety and depression (K6). This means that young old (aged 70-80 were more likely suffer from anxiety and depression symptoms (P=<0.05) compared to oldest-old (80 + years). Psychological disorders were also higher in those living in rented accommodation compared to homeowners or mortgage holders. Meanwhile, homeowner and Jobless were strong predictors of low incident psychological disorders, as anxiety and depression (P=0.011), (P=0.040) respectively (Table 1). Overall the model explained about 13% of the variance in mental health (K6) of the participants. Of the SES factors, only housing was significantly associated with the psychological wellbeing (P=0.022) see Table 2.

The socio-demographic components (age, sex, source of money, money satisfaction, living with who in house and education) were utilised to predict physical health status (ADL and physical functioning/SF-36 short form) of the participants. The oldest-old (80+ years) individuals and people who were supported by their child (P=0.001) were significantly dependent on others for their ADL (Table 3). The socio-demographic factors explained 33% of the variance in activities of daily living (ADL) of the participants. Further participants' physical functioning (SF36) was predicted by their SES factors. The results show that age, sex, source of money, money satisfaction, private health insurance, housing, living with who in house and education were significant predictors of physical function limitations (Table 4). There was a higher level of limitation in physical function in old women (P< 0.000). Individuals who had child sponsor as a source of money had worse physical function (P< 0.005). Money satisfaction showed a negative linear relationship with physical function score in Iranian elderly (P< 0.032). Elderly individuals who lived with friends and neighbours rather than with family members, had a higher level of limitation in physical function (P< 0.045). Older people who had high school and diploma qualification are more likely to have better physical health status i.e., physical function (P< 0.008) compared to the other two education groups (see Table 4). The model is strong in explaining 39% of the variance in physical function of the participants.

Discussion

A key finding of this study was the strong patterning of mental disorders and physical health difficulties amongst elderly people who had current economic difficulties, such as employment, housing, source of money and money satisfaction. A number of studies show that poor present economic conditions are associated with common mental disorders [27, 28]. The factors behind the associations of past and present economic difficulties with mental disorders are not well known, but the etiological processes for the difficulties may well be different [29]. Low education and income remained significant predictors of anxiety and depression incidence. The contribution of the explanatory factors in reducing the SES differences in the incidence of mental disorders may have been larger if these factors had also been considered longitudinally [30].

In the Whitehall II Study, work characteristics, low job control in particular, explained much of the social inequalities in depressive symptoms [12]. The study consisted of white-

Table 3: Regression model of physical health status-ADL difficulties and socio-demographic predictors' differences

Coefficients[a]								
	Baseline	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)		4.379	.350		12.519	.000	3.691	5.067
Age	60-70							
70-80 years old		-.462	.166	-.128	-2.788	.006	-.787	-.136
80-90 years old		-2.158	.210	-.483	-10.259	.000	-2.571	-1.744
Source of money	Employee							
Private property		-.227	.319	-.039	-.710	.478	-.854	.400
Retirement wage		-.267	.238	-.077	-1.120	.264	-.736	.202
Charity		-.592	.408	-.072	-1.451	.148	-1.394	.210
Child sponsor		-.924	.284	-.205	-3.255	.001	-1.482	-.366
Other		-.657	.344	-.096	-1.912	.057	-1.333	.019
Private health insurance	Yes							
No		-.219	.198	-.049	-1.102	.271	-.609	.171
Don't know		-1.510	.501	-.135	-3.011	.003	-2.496	-.524
Living with who in house	No-one/alone							
Only husband / wife		.581	.240	.137	2.422	.016	.109	1.052
Husband/wife & children		.348	.223	.099	1.562	.119	-.090	.786
Only children		-.358	.251	-.077	-1.426	.155	-.853	.136
Sisters & brothers & family		.539	.542	.043	.996	.320	-.526	1.604
Friends & neighbors		-2.623	1.066	-.106	-2.460	.014	-4.719	-.527

collar middle-aged men and women, whilst our study consists of people aged 60+ years who mostly (53%) were unemployed or previous work characteristics in the current or previous job were not measured. The direct availability of financial resources might be important for SES differences in mental status [31]. Our study showed that elderly participants with no money satisfaction experience low mental (K6) and physical functioning (SF-36 short form). Thus, a lack of financial resources held by individuals might be important in explaining anxiety and depression (K6) and physical function limitation.

This study shows that older people with a low level of education or low income are especially at risk of developing depression and physical function limitations. In primary care services, special attention is needed for persons with low SES, not only for early recognition but also for care and treatment [32].

In the present study, the frequency of elderly people with indications of depression and anxiety was 46.5%. A study carried out in north eastern Brazil [33] found that 24% of elderly participants presented with depression, within the age range 60 to 90 years. In southeastern Brazil [34], the prevalence of depressive symptoms among elderly people in São Paulo was 18.1%. The highest rate was 19.5%, among people aged 60 to 64 years, which was similar to the rate of 13% amongst participants aged 75+ in the present study.

The prevalence of mental disorders in this study, as well as in many other studies, was higher among eldery women than men [35], but it is not clear how the socioeconomic status of mental disorders varies by gender. Some previous results show differential associations for women and men [36]. In a Canadian study on health and aging, the prevalence of severe depression was 2.6% and mild depression was 4%. This prevalence was higher among women who reported limitations on their activities due to chronic health problems [37].

Poorer physical functions also contributed to the SES differences in depression incidence, whereas diseases were less important. However, behavioral factors were less likely to be associated with the incidence of mental disorders, which was not examined in our study, which is one of the limitations of this study. This explains the minor role of these factors in reducing the SES components in incident anxiety and depression, which was also found in other studies [13, 38]. Psychosocial factors and physical health status explained on average less than a quarter of the SES differences in incident depression [8].

In a Brazilian study, [39] it was found that the level of functional dependence was higher between elderly males and those who were married. On the contrary, our study shows that higher level of limitation in physical function found in older women and those who were dependent on child support as a source of income.

In our study, age was found to be an important factor in determining the mental health status of the Iranian elderly. Results indicate that middle-old (70-80 years) is more likely to suffer from depressive symptom compared to young-old (60-70 years). A similar result is reported by Weyerer S, Eiffl aender-Gorfer S, Köhler L, et al [40], which shows that age is positively associated with the increase in depressive symptoms among elderly in general. However, the study among Brazilian elderly [39] found that the number of depressive symptoms was not significantly higher in older age groups. In a study to identify demographic and socioeconomic differentials associated with the health status of oldest-old individuals living in two cities of different Brazilian regions, [39] it was found that male elderly, married and with higher income level showed fewer depressive symptoms. Researchers [39] expressed that elderly males aged between 80 and 84 years, married and with a higher level of education performed better in the Mini Mental Scale Exam (MMSE), with statistical significance. Such associations showed this significance for age, level of education and sex, and a trend towards significance for marital status. These associations between MMSE and demographic variables are in accordance with those found in other studies [41. However our study did not use MMSE to assess.

Limitations of the study

Access to a large sample of elderly who can potentially be followed-up using the same methods and including a range of explanatory variables are methodological assets of the study. However some limitations must be considered. First, since only baseline data on explanatory factors were analyzed, the association between SES and explanatory factors might have resulted explanatory factors influence SES [42]. This selection result might have a larger effect on income than on educational level, as the latter indicator is less sensitive to change during adulthood. In our studies, similar results were found across all SES indicators, including education. Second, because this study used only a sample consisting of randomized health centers in the Tehran metropolitan area, it may not be entirely representative of rural dwelling elderly people. Third, the depression status is regularly associated with changes in a number of healthy life style behaviors including diet, exercise, and sleep, which may continue after the depression remits with impacts on health [43]. This study is limited as it did not include healthy life style related question and its impacts on depression and health, similarly, given the mutual relationship between late-life depression and dysfunction impairment in cognitive domains, it is likely that this dysfunction cooperation in the health self care of the elderly [44]. Fourth, a prior depression history could be a risk indicator of a more determinant of physical health outcome such as childhood maltreatment, given that the latter strongly predicts poor psychiatric and physical health outcomes in adulthood [45]. Finally, information on physical health status was based on self-report, which may have led to an under- or overestimation of this factor in the explanation of SES differences in physical limitation and mental disorders incidence.

Despite these limitations, this study examined psychological distress with two dimensions of anxiety (somatic anxiety and worry) and depression (low positive affect and depressive symptoms). Although anxiety is very common among the elderly, there is still a lack of research in this area [46].

Conclusions and Recommendations

In summary, low SES predicted the incidence of depression and physical function limited in the Iranian elderly. A key finding of this study was that economic difficulties were strongly associated with mental disorders and physical health limitations. Our results highlight the potential importance of

(pages 18 and 19):

Table 4: Regression model of physical health status- Physical Function limited and socio-demographic predictors' differences

Coefficients[a]								
	Baseline	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)		25.989	1.703		15.262	.000	22.069	27.668
Sex	Male	-2.538	.582	-.211	-4.358	.000	-3.714	-1.424
Age	60-70							
70-80 years old		-1.967	.556	-.159	-3.539	.000	-3.040	-.854
80-90 years old		-5.727	.714	-.374	-8.020	.000	-7.193	-4.392
Marital Status	Single	.900	.916	.073	.983	.326	-.785	2.803
Source of money	Employee							
Private property		-1.268	1.173	-.063	-1.081	.280	-3.622	.990
Retirement wage		-1.449	.943	-.122	-1.537	.125	-3.020	.604
Charity		-2.128	1.414	-.076	-1.504	.133	-4.513	.939
Child sponsor		-3.009	1.053	-.195	-2.858	.005	-5.061	-.919
Other		-1.317	1.358	-.056	-.969	.333	-3.724	1.564
Money satisfaction	Yes							
No		-1.557	.721	-.128	-2.159	.032	-3.017	-.183
So so		-.316	.795	-.023	-.397	.692	-1.936	1.188
Private health insurance	Yes							
No		-.309	.671	-.020	-.460	.646	-1.691	.941
Don't know		-3.999	1.660	-.105	-2.408	.017	-7.152	-.628
Housing	Home owner							
Paying rent		.435	.735	.025	.591	.555	-1.101	1.775
Home children		-.410	.803	-.024	-.511	.609	-2.023	1.134
Home family		.039	1.553	.001	.025	.980	-3.094	3.010
Other		-5.238	2.479	-.087	-2.113	.035	-10.350	-.631

Living with who in house								
Only husband/wife	No-one/alone	.079	1.067	.005	.074	.941	-2.131	2.051
Husband/wife & children		.342	1.023	.028	.334	.738	-1.764	2.247
Only children		.645	.849	.040	.759	.448	-1.041	2.301
Sisters & brothers & family		1.202	1.905	.028	.631	.528	-2.709	4.765
Friends & neighbors		-7.121	3.535	-.084	-2.014	.045	-14.217	-.315
Education	Illiterate							
Primary		.231	.561	.019	.411	.681	-.857	1.352
High school & diploma		2.226	.831	.122	2.678	.008	.568	3.837
University degrees		2.143	1.483	.064	1.445	.149	-.717	5.116
Employment	Employee							
Retirement wage		1.372	.858	.105	1.598	.111	-.273	3.102
jobless		-.301	.835	-.025	-.360	.719	-1.921	1.365
Insurance	Yes	-.960	.801	-.054	-1.198	.232	-2.535	.615

current economic conditions in undermining mental health [29]. Findings of the study suggest that financially supporting elderly who are facing everyday economic difficulties is likely to be beneficial for their mental and physical health. Moreover, intervention upon psychosocial characteristics and improving physical function may lower the SES differences and reduce the risk for depression and its consequences for wellbeing. The SES differences in incident depression remain, however, to a large extent unexplained. Thus, further study using a mixed method is needed to reveal more detail of the pathways through which low SES leads to health of the elderly. The findings can help policy makers to address SES issues in order to reduce elderly Iranians' low mental health and improve their wellbeing.

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References

1- Miller Chenier N. The health of the Canadian elderly Political and Social Affairs Division November 1993.
2- Hsu HC. Gender Differences in health-related quality of life among the elderly in Taiwan. Asian Journal of Health and Information Sciences. 2007; 1(4):366-76.
3- Momeni P, Wettergren L, Tessma M, Maddah S, Emami A. Factors of importance for self-reported mental health and depressive symptoms among ages 60-75 in urban Iran and Sweden. Scand J Caring Sci. 2011 Dec;25(4):696-705.
4- Tajvar M, Arab M, Montazeri A. Determinants of health-related quality of life in elderly in Tehran, Iran. BMC Public Health. 2008 Sep 22;8:323.
5- Martikainen P, Stansfeld S, Hemingway H, Marmot M. Determinantsof socioeconomic differences in change in physical and mental functioning. Soc Sci Med 1999; 49:499- 507.
6- Everson S, Maty S, Lynch J, Kaplan G. Epidemiologicevidence for the relation between socioeconomic status and depression,obesity, and diabetes. J Psychosom Res. 2002; 53:891- 5.
7- Lorant V, Deliege D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: a meta-analysis. Am J Epidemiol. 2003;157 :98-112.
8- Kostera A, Bosmaa H, I.J.M. G, et al. Socioeconomic differences in incident depression in older adults: The role of psychosocial factors, physical health status, and behavioral factors. Journal of Psychosomatic Research 2006; 61:619-27.
9- El-Gabalawy R, Mackenzie C, Shooshtari S, Etal. Comorbid physical health conditions and anxiety disorders: a population-based exploration of prevalence and health outcomes among older adults. General Hospital Psychiatry. 2011; 33: 556-64.
10- Wolitzky-Taylor K, Castriotta N, Lenze E, al e. Anxiety disorders in older adults: a comprehensive review. Depress Anxiety. 2010; 27(2):190-211.

11- Lu BY, Ahmed I. The mind-body conundrum: the somatopsychic perspective in geriatric depression. Am J Geriatr Psychiatry. 2010; 18(5):378-81.
12- Gazmararian J, Baker D, Parker R, al e. A multivariate analysis of factors associated with depression: evaluating the role of health literacy as a potential contributor. Arch Intern Med. 2000; 160:3307-14.
13- Stansfeld S, Head J, Fuhrer R, Wardle J, Cattell V. Social inequalities in depressive symptoms and physical functioning in the Whitehall II study: exploring a common cause explanation. J Epidemiol Community Health. 2003; 57:361- 7.
14- Bosma H, Van Jaarsveld C, Tuinstra J, al e. Low control beliefs, classical coronary risk factors, and socio-economic differences in heart disease in older persons. Soc Sci Med. 2005; 60:737-45.
15- Ormel J, Oldehinkel A, EI B, al e. The interplay and etiological continuity of neuroticism, difficulties, and life events in the etiology of major and subsyndromal, first and recurrent depressive episodes in later life. Am J Psychiatry. 2001;158:885- 91.
16- Maimaris W, Bchir B, Hogan H, Etal. The Impact of Working Beyond TraditionalRetirement Ages on Mental Health: Implications for Public Health and Welfare Policy. Public Health Reviews. 2010; 32(2): 532-48.
17- Dalstra J, Kunst A, Borrell C, al e. Socioeconomic differences in the prevalence of common chronic diseases: an overview of eight European countries. Int J Epidemiol. 2005; 34:316-26.
18- Bisschop M, Kriegsman D, Deeg D, al e. The longitudinal relation between chronic diseases and depression in older persons in the community: the Longitudinal Aging Study Amsterdam. J Clin Epidemiol. 2004; 57:187-94.
19- Melzer D, Izmirlian G, Leveille S, al e. Educationaldifferences in the prevalence of mobility disability in old age: the dynamics of incidence, mortality, and recovery. J Gerontol B Psychol Sci Soc Sci. 2001; 56:294- 301.
20- Koster A, Penninx B, Bosma H, et al. Is there a biomedical explanation for socioeconomic differences in incident mobility limitation? J Gerontol A Biol Sci Med Sci. 2005; 60:1022-7.
21- Harris T, Cook D, Victor C, al e. Predictors of depressive symptoms in older people-a survey of two general practice populations. Age & Ageing. 2003; 32:510- 8 .
22- Ormel J, Rijsdijk F, Sullivan M, al e. Temporal and reciprocal relationship between IADL/ADL disability and depressive symptoms in late life. J Gerontol B Psychol Sci Soc Sci. 2002; 57:338 -47.
23- New South Wales Department of Health. New South Wales older people's health survey 1999
New South Wales Public Health Bulletin. 2000; 11(S-2):1-62.
24- Alizadeh -Khoei M. Assessing health factors and utilization of aged care services in Iranian elderly in Metropolitan Sydney Australia: The Sydney University; 2008.
25- Beaton DE, et al. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine. 2000; 25(24):pp. 3186-91.
26- Mackinnon A, Jorm AF, Hickie IB. A national depression index for Australia. Medical Journal of Australia. 2004; 181 (7): pp. 52-6.
27- Cheng YH, Chi I, Boey K, etal. Self-rated economic condition and the health of elderly persons in Hong Kong. Social Science & Medicine. 2002;55:1415-24.
28- Fryers T, Melzer D, Jenkins R. Social inequalities and the common mental disorders: A systematic review of the evidence. Social Psychiatry And Psychiatric Epidemiology. 2003; 38:229-37.
29- Zimmerman FJ, Katon W. Socioeconomic status, depression disparities, and financial strain: What lies behind the income-depression relationship? . Health Economics Epub ahead of print. 2005.
30- Mulder M, Ranchor A, Sanderman R, etal. The stability of lifestyle behaviour. Int J Epidemiol 1998; 27:199-207.
31- Lynch J, Smith G, GA K, etal. Income inequality and mortality: importance to health of individual income, psychosocial environment, or material conditions. BMJ 2000; 320:1200- 4.
32- Ten Have M, de Graaf R, Vollebergh W, etal. What depressive symptoms are associated with the use of care services? Results from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). J Affect Disord 2004; 80:239-48.
33- Leite V, Carvalho E, Barreto K, etal. Depressão e envelhecimento: estudo nos participantes do Programa Universidade Aberta à Terceira Idade. Rev Bras Saude Matern Infant. 2006; 6(1):31-3.
34- Lebrão ML, R. L. Saúde, bem-estar e envelhecimento: o estudo SABE no Município de São Paulo. Rev Bras Epidemiol. 2005; 8(2):127-41.
35- Emslie C, Fuhrer R, Hunt K. Gender differences in mental health: Evidence from three organisations. Social Science & Medicine. 2002; 54:621-24.
36- Muntaner C, Borrell C, Benach J, etal. The associations of social class and social stratification with patterns of general and mental health in a Spanish population. International Journal of Epidemiology. 2003;32:950-8.
37- Ostbye T, Kristjansson B, Hill G, etal. Prevalence and predictors of depression in elderly Canadians: the Canadian study of health and aging. Chronic Dis Can. 2005; 26(4):93-9.
38- West C, Reed D, Gildengorin G. Can money buy happiness? Depressive symptoms in an affluent older population. J Am Geriatr Soc. 1998; 46:49-57.
39- Rosseti I, Roriz-CruzII M, SantosIII J, Etal. Socioeconomic and health differentials between two community-dwelling oldest-old groups. Rev Saúde Pública. 2011;45(2) :1-9.
40- Weyerer S, Eiffl aender-Gorfer S, Köhler L, etal. Prevalence and risk factors for depression in non-demented primary care attenders aged 75 years and older. J Affect Disord. 2008; 111(2-3):153-63.
41- Morais E, Rodrigues R, Sousa V. Assessment of depressive symptoms and cognitive impairment in elders from rural areas of the Brazilian State of Rio Grande do Sul. Public Health Nurs. 2009; 26: 3: 249-358
42- Blane D, Davey Smith G, Bartley M. Social selection: what does it contribute to social class differences in health? . Socio Health Illn. 1993;15:1-15.
43- Bruce M. Depression and disability in late life: directions for future research. AmJ Geriatr Psychiatry. 2001;9:102-12.
44- Cui X, Lyness J, Tu X, etal. Does depression precede or follow executive dysfunction? Outcomes in older primary care patients. Am J Psychiatry 2007; 164:1221-8.
45- Arnow B. Relationships between childhood maltreatment, adult health and psychiatric outcomes, and medical utilization. J Clin Psychiatry 2004;65:10-5.
46- Lenze E, Rogers J, Martire L, et al. The association of late-life depression and anxiety with physical disability: A review of the literature and prospectus for future research. American Journal of Geriatric Psychiatry. 2001;9:113-35.

Original Contribution/Clinical Investigation

Relation between the psychological impact of presbycusis and Hearing Handicap Inventory for the Elderly using screening version in Jordan

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ABSTRACT

Objective

Presbycusis: this inevitable deterioration in hearing ability that occurs with age and is very common. In fact one in three adults over age 65 are affected by this deterioration. The goal of this study was to assess the psychological impact of presbycusis in Jordan according to the Hearing Handicap Inventory for the Elderly using screening version HHIE-S.

Methods: A cross-sectional study was done in Prince Ali hospital in Al-karak, Jordan between October 2011 and February 2012 by clinical examination and a questionnaire by audiologist and otolaryngologist for 230 physically healthy men and women known to have age related sensorineural hearing loss with ages that spanned from 55 to 70 years. Participants in this study were screened by the Hearing Handicap Inventory for the Elderly using screening version HHIE-S.

Results: All the participants scored more than 8 in the HHIE-S.

100 participants (43.4%) scored more than 10 but less than 24 in the HHIE-S (group A), 18 participants of whom (18 %) complained of psychological symptoms (isolation, frustration and embarrassment). 130 participants (56.5%) scored more than 24 in the HHIE-S, (group B), 93.8% of them are older than 63 years, 34.6 % of them complained of psychological symptoms (isolation, frustration and depression)
.

Conclusion: Findings from this cross-sectional study suggest that the psychological symptoms due to presbycusis increase significantly with aging if left untreated, and there is a proportional relation between HHIE-S score and the psychological symptoms which means it could be used as a simple method for follow up of the inevitable deterioration of hearing and its psychological impact.

Keywords: Presbycusis, Hearing Handicap Inventory for the Elderly using screening version, Jordan.

Presbycusis

This term has been newly replaced by a new term; age related hearing loss, the former term is derived from presbyacusia used to describe a loss of high-frequency hearing acuity in the elderly.

Characteristically, presbycusis involves bilateral high-frequency hearing loss associated with difficulty in speech discrimination and central auditory processing of information. However, other patterns of presbycusis exist. The association between advanced age and high-tone deafness was first described by Zwaardemaker in 1899. Since then, extensive research has attempted to determine the pathologic changes of presbycusis, but the exact mechanisms remain unknown.
Presbycusis is an important problem in society. It occurs in an elderly population that relies on special senses to compensate for other age-associated disabilities. Elderly individuals may rely on their hearing to overcome limitations of impaired vision and slowed reaction time. In addition, age-associated decline in concentration and memory contribute to difficulty understanding speech, especially in noisy situations. Hearing loss may contribute to the isolation of some elderly people by restricting their use of the phone, causing them to avoid social opportunities such as concerts and social gatherings, and amplifying their sense of disability, which could result in depression.

Materials and Methods

The Hearing Handicap Inventory for the Elderly - Screening (HHIE-S) can be used to screen
elderly patients for problems associated with hearing impairment. The instrument can be used
together with hand-held audioscopes in primary care settings lacking audiometric facilities.

Here we used it in addition to clinical exam and psychological evaluation to find the relation between its score and the psychological impact of presbycusis.

The HHIE-S questionnaire contains 10 questions; for each statement the answer is YES, NO or SOMETIMES.

1. Does a hearing problem cause you to feel embarrassed when you meet new people?
Would you say …
No _____ Yes _____ Sometimes _____

2. Does a hearing problem cause you to feel frustrated when talking to members of your family?
No _____ Yes _____ Sometimes _____

3. Do you have difficulty hearing when someone speaks in a whisper?
No _____ Yes _____ Sometimes _____

4. Do you feel handicapped by a hearing problem?
No _____ Yes _____ Sometimes _____

5. Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?
No _____ Yes _____ Sometimes _____

6. Does a hearing problem cause you to attend religious services less often than you
would like?
No _____ Yes _____ Sometimes _____

7. Does a hearing problem cause you to have arguments with family members?
No _____ Yes _____ Sometimes _____

8. Does a hearing problem cause you to have difficulty when listening to television or radio?
No _____ Yes _____ Sometimes _____

9. Do you feel that any difficulty with your hearing limits/hampers your personal or social life?
No _____ Yes _____ Sometimes _____

10. Does a hearing problem cause you difficulty in a restaurant with relatives or friends?
No _____ Yes _____ Sometimes _____

Total 'No' _____ X 0 = _____
Total 'Yes' _____ X 4 = _____
Total 'Sometimes' _____ X 2 = _____

TOTAL SCORE _____

231 physically healthy participants were selected, known to have age related sensorineural hearing loss, and who never used hearing aids and had no external or middle ear pathology. The age of the participants spanned between 55 and 70 years, with mean age of 62.83.

The participants were examined clinically, and then filled in the questionnaire under observation of audiologist and otolaryngologist. A careful detailed history was taken to evaluate and assess any psychological symptoms.

Results

All the participants scored more than 8 in the HHIE-S.

100 participants (43.4%) scored more than 10 but less than 24 in the HHIE-S (group A), 18 participants of whom 18 % complained of psychological symptoms (isolation, frustration and embarrassment).

130 participants (56.5%) scored more than 24 in the HHIE-S, (group B); 93.8% of them were older than 63 years. 34.6 % of them complained of psychological symptoms (isolation, frustration and depression).

Discussion

HHIE-S was used here to follow and evaluate the known cases of prespycusis for the presence of psychological impact of hearing loss in the elderly. The use of HHIE-S is a simple easy way to sort the patients and evaluate them for further management, and can be further used to follow the management and response of using Hearing aids. This cross-sectional study is consistent with the literature regarding the increase of hearing deterioration with age, which will result in more psychological effects on the patients and according to the above mentioned

Score	impairment	(interval)	impairment
0-8	30%	0.36 (0.19 - 0.68)	13%
10-24	30%	2.30 (1.22 - 4.32)	50%
25-40	30%	12.00 (2.62 - 55.00)	84%

HHIE-S score	sensitivity	specificity	positive predictive value	negative predictive value	test accuracy
> 8	72%	77%	58%	86%	74%
> 24	41%	92%	67%	78%	76%

results HHIE-S can be of great value for assessment and follow up of these patients.

References

Jennings CR, Jones N5. Presbycusis. Journal of Laryngology and Otology. 115: 171-8.

Ohlemiller KK. Age-related hearing loss: the status of Sckuknecht's typology. Current Opinion in Otolaryngology and Head and Neck Surgery. 2004; 12: 439-43.

Gratton ME, Vazquez AE. Age-related hearing loss: current research. Current Opinion in Otolaryngology Head and Neck Surgery. 2003; 11: 367-71.

Caspary DM. Aging and hearing. Hear Res 2010; 264: 1-2.

Ventry IM, Weinstein BE. The hearing handicap inventory for the elderly: a new tool. Ear Hear 1982; 3: 128-34.

Lichtenstein MJ, Bess FH, Logan SA. Validation of screening tools for identifying hearing impaired elderly in primary care. JAMA. 1988; 259: 2875-2878.

American Speech-Language-Hearing Association. Guidelines for the identification of hearing impairment/handicap in adult/elderly persons. ASHA 1989; 31: 59-63.

Raynor LA, Pankow JS, Miller MB, Huang GH, Dalton D, Klein R et al. Familial aggregation of age-related hearing loss in an epidemiological study of older adults. Am J Audiol 2009; 18:
114-18.

Makishima K. Clinicopathological studies in presbycusis. Otologia Fukuoka.

Schuknecht HF. Further observations on presbycusis. Arch Otolaryngology. 1964;80:369.

Original Contribution/Clinical Investigation

Comparison of outcomes following uncemented hemiarthroplasty and dynamic hip screw in the treatment of displaced subcapital hip fractures

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ABSTRACT

Objectives: to evaluate treatment methods in femoral neck fractures to determine the most effective treatment.

Patients and methods: A prospective study that was conducted at Prince Hashim military hospital located in Al Zarqa city in Jordan during the period between October 2010 and January 2012. One hundred and twenty one patients were enrolled in the study. They were assigned into two groups: group A 60 Patients were treated by closed reduction and dynamic hip screws and group B 61 were treated with hemiarthroplasty. (Diagnosis was made based on Historical information which included basic demographic data (age, education, gender, income, race).

The presence and severity of comorbid diseases such as ischemic heart disease, congestive heart failure, hypertension, cerebrovascular disease, neurologic disease, chronic obstructive lung disease, asthma, peripheral vascular disease, coagulopathy, deep venous thrombosis, pulmonary embolism, and cancer will be documented.

History of smoking and alcohol use will be determined. The history of falling, and the patient's current medication use in the last 3 months will be documented as well as the patient's clinical and radiological findings.

Most of the patients were treated for Garden III and IV intracapsular fractures of the femoral neck. All patients with Garden I and II injuries, pathological fractures, and mental confusion were excluded from the study cohort, as were bedridden patients.

Results: According to group A, 38 patients were female and 22 were male, with mean age of 74 years (range 68 to 80), while in group B there were 37 female patients and 24 males, with a mean age of 72 years (range: 70 to 84). In group A, 44 patients (73%) had excellent/good results using Matta's scoring system and 16 patients (27%) had fair/poor results. In group B, 42patients (68%) had excellent/good results and 19 patients (32%) had fair/poor results.

In Group A, 16 patients (27%) required conversion to total joint arthroplasty; ten patients as a result of osteo necrosis of the femoral head, with three patients secondary to non-union, and in three patients owing to fatigue failure of the plate. In Group B, 10 patients (16%) required conversion to total joint arthroplasty; five patients due to loose prostheses causing pain, two patients due to recurrent dislocation, and three patients due to acetabular protrusion.

Conclusion: There was no statistical difference between either group with regards to failure of the index procedure and re-operation rates, but there is a higher revision rate for femoral neck fractures treated with internal fixation versus those managed with hemiarthroplasty.

Hip fracture is a common problem in people aged >60 years. According to the American Academy of Orthopaedic Surgeons, the number of patients who need admissions in the United States resulting from hip fracture is expected to increase in the future; respectively in the UK the number of the hip fracture is expected to increase due to increasingly aging populations, and this is also expected in our countries in the Middle East.

Half of all hip fractures are displaced intracapsular fractures, i.e. unstable fractures in which the blood supply to the femoral head may be impaired, affecting the rate of fracture healing. The treatment for displaced intracapsular fractures is currently determined by the mobility and functional demands of the patient.

We deal in this study with the patients who have Garden III and Garden IV.In Garden III , the distal fragment is rotated laterally. The proximal fragment is tilted into varus and rotated medially. The medial trabeculae of the head are in alignment with those of the pelvis; In Garden IV, the capital fragment is completely detached from the distal fragment and has returned to its normal position in the acetabulum; the medial trabeculae are not in alignment with those of the pelvis. The distal fragment is displaced upward and anterior to the proximal segment.

According to the treatment of subcapital femoral neck fracture there are three types of treatment which are;

a) closed reduction with internal fixation,
b) hemiarthroplasty, this article discussed both these treatments and
c) Total hip arthroplasty.

Outcomes assessed included surgical time, blood loss, wound infections, postoperative complications, and mortality.

Eight studies assessed the length of surgery, and all reported decreased surgical time for the patients treated with internal fixation (average, 22 minutes). Additionally, the internal fixation group had a more favorable outcome in terms of blood loss, need for postoperative blood transfusions, and infection rates. No differences between the groups were found regarding mortality rates, pain, or mobility; however, there was a higher reoperation rate with internal fixation than with hemiarthroplasty.

Patients and Methods

A prospective study that was conducted at Prince Hashim military hospital located in Al Zarqa city in Jordan during the period between October 2010 and January 2012. One hundred and twenty one patients were enrolled in the study. They were assigned into two groups: Group A 60 patients were treated by closed reduction and dynamic hip screws and Group B where 61 were treated with hemiarthroplasty, (Diagnosis was made based on historical information which included (age, education, gender, income, race).

The presence and severity of comorbid diseases such as ischemic heart disease, congestive heart failure, hypertension, cerebrovascular disease, neurologic disease, chronic obstructive lung disease, asthma, peripheral vascular disease, coagulopathy, deep venous thrombosis, and pathological bone disease will be documented.

History of smoking and alcohol use will be determined. The history of falling, and the patient's current medication use in the last 3 months will be documented as well as the patient's clinical and radiological findings.
Most of the patients were treated for Garden III and IV intracapsular fractures of the femoral neck. All patients with Garden I and II injuries, pathological fractures, and mental confusion were excluded from the study cohort, as were bedridden patients.

The most common complications (according to the patients in this study) we faced during dynamic hip screws are femoral head osteonecrosis, nonunion, failure of the plate fixation; on the other hand the complications of hemiarthroplasty were dislocation of the prosthesis, pain due to loose prosthesis, and acetabular protrusion.
Two approaches are used in this study, the anterolateral approach for hemiarthroplasty, and the lateral approach for dynamic hip screw.

The time, the amount of blood loss and the blood transfusion postoperatively which was needed for dynamic hip screw are less than that in hemiarthroplasty.

All patients had a single suction drain removed on post operative day one and all received prophylactic second generation cephalosporin antibiotic.

Patients were on low molecular weight heparin, which was discontinued on discharge from hospital. Physical therapy was started on the second postoperative day and ambulation progressed as tolerated until fit for discharge.

Results

According to group A, 38 patients were female and 22 were male, with mean age of 74 years (range 68 to 80), while in group B there were 37 female patients and 24 males, with a mean age of 72 years (range: 70 to 84). In group A, 44 patients (73%) had excellent/good results using Matta's scoring system and 16 patients (27%) had fair/poor results. In group B, 42 patients (68%) had excellent/good results and 19 patients (32%) had fair/poor results.

In Group A, 16 patients (27%) required conversion to total joint arthroplasty ; ten patients as a result of osteonecrosis of the femoral head, three patients secondary to non-union, and three patients owing to fatigue failure of the plate. In Group B, 10 patients (16%) required conversion to total joint arthroplasty; five patients due to loose prostheses causing pain, two patients due to recurrent dislocation, and three patients due to acetabular protrusion.

There were no differences in the rate of pain, mortality and in mobility.

Discussion

Our data in incidence is almost similar to that reported by others, as mentioned, and the tendency of the complications which occur: the ideal treatment of displaced intracapsular fractures is not straightforward.

Our study suggests there was no big statistical difference between either group with regards to failure of the index procedure and re-operation rates, and a rigid internal fixation for subcapital femoral neck fracture is required if union is to be predictable; because nonunion and osteonecrosis develop frequently after internal fixation of displaced femoral neck fractures, and the rate of operation is higher in internal fixation than hemiarthroplasty in Garden III and Garden IV. There are no differences in the pain, mortality and mobility rates.
We recommend, as do many surgeons hemiarthroplasty replacement as an alternative in elderly ambulatory patients.

References

1. American Academy of Orthopedic Surgeons. Conference on Care for Patients with Hip Fracture, 2001; Rosemont, IL.
2. Parker MJ, Pryor GA. Internal fixation or arthroplasty for displaced cervical hip fractures in the elderly: a randomised controlled trial of 208 patients. Acta Orthopaedica Scandinavica 2000;71: 440-446.
3. Crossman PTK. A survey of the treatment of displaced intracapsular femoral neck fractures in the UK. Injury 2002;33: 383-386.
4. Parker MJ, Gurusamy K. Modern methods of treating hip fractures. Disability and Rehabilitation 2005; 27: 1045-1051.
5. Goodwin RA. The Austin Moore prosthesis in fresh femoral neck fractures. Am J Orthop Surg 1968 ; 2 : 40-43.
6. Skinner PR, et al. Displaced subcapital fractures of the femur: a prospective randomized comparison of internal fixation, hemiarthroplasty and total hip arthroplasty. Injury.1989;20: 291-293.
7. Barnes R, Brown JT, Garden RS. Subcapital fractures of the femur : A prospective review. J Bone Joint Surg 1976 ; 58-A : 2-24.
8. Koval KJ, Zuckerman JD. Hip fractures: Overview and evaluation and treatment of femoral neck fractures. J Am Acad Orthop Surg 1994 ; 2 : 141-149.
9. Enocson A, Hedbeck CJ, Tidermark J Crossman PTK. A survey of the treatment of displaced intracapsular femoral neck fractures in the UK. Injury 2002; 33: 383-386
10. Melton LJ. Hip fractures: A worldwide problem today and tomorrow. Bone. 1993; 14 (suppl):S1-S8.

Living Arrangements and Health Well Being among Elderly Women in India

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ABSTRACT

Objectives: Elderly women suffer from multiple disadvantages resulting from biases to gender and widowhood. This study will pertain to understand the association between living arrangements and health well being among elderly women in India.

Methods: The present study utilised data from Indian Human Development Survey (IHDS 2005). Both Bivariate and multivariate analysis have been applied in this study.

Result: Eighty three percent of elderly women are living in joint families and three percent are living alone in India. The number of women living in a joint family is higher in urban (84%) than rural (82%) areas. Women's age, marital status and economic status are found as significant determinants of their living arrangements as well as their health well being. High BP has the highest burden on health in India. Women who are living alone are likely to suffer with any short term and long term morbidity, than other categories of living arrangements.

Conclusion: The elderly population, particularly women, are more likely to suffer with multiple health and psychological problems. There is an urgent need to pay greater attention to elderly women and to support holistic policies and programs for ensuring their health well being and social security.

Key words: Living arrangement; Elderly; Health well being

Introduction

Ageing is an outcome of demographic processes in a society. Old age and ageing have been ever present throughout the centuries. The aged population in India is growing very rapidly. The reduction in fertility level, reinforced by steady increase in life expectancy has produced fundamental changes in the age structure of the population, which in turn leads to the ageing population. The 2001 census has shown that nearly 77 million people in India are above 60 years of age which accounts for 7.5 percent of the total population. The proportion of 60+ population in India has grown 5.63 percent in 1961 to 6.58 percent in 1991 and 7.5 percent in 2001 (Irudaya Rajan 2006). It is expected that the elderly population in India will increase to about 180 million by 2025, equating to 14 percent of the population (NSSO 1998; Mishra & Sharma 1999; Ramamurti & Jamuna 2004) and to about 301 million by 2051 which constitutes 17.5 percent of the population (Irudaya Rajan 2006).

Increase in the size of the elderly population in India is a subject of concern for public policy as this may pose rising pressure on various socio economic fronts including pension outlays, health infrastructure, social protection etc. Living arrangements of elderly persons has been extensively studied in the Asian countries (Kamo, Y. and Zhou, M 1994; Palloni, A 2001). These studies have identified a number of factors such as age, sex, occupation, education, place of residence, number of children etc., as the important variables that shape living arrangements (United Nations, 2005; Yadava, Yadava and Sarma , 1996; Jaiprakash, 1999). Velkoff (2001) found that living arrangements are influenced mainly by financial well being, marital status, family size and structure as well as cultural traditions. Little research has been conducted on the issue in gendered dimensions of ageing (Munsur et al 2010). In a patriarchal society like India where women are the key victims of gender discrimination since their birth, it is imperative to see social well being and health status in their old age. A few studies have revealed that elderly women are universally more vulnerable in social, economic and health disadvantage than older men. (Mba 2004; 2005;) Poverty and social exclusions are the great threats for elderly well being and women are often a more vulnerable segment in this group as they suffer from multiple disadvantages resulting from biases to gender, widowhood and old age. Elderly women, especially widows, who are living alone, are considered to be at risk of economic destitution, social isolation, poor health and death (Abedin, 2003; Kabir et al., 2005). In this context, understanding the living arrangements among elderly women is essential. This study will focus on the association between living arrangements and health well being among elderly women in India.

Data and Methodology

The present study used the first round of the Indian Human Development Survey (IHDS 2005) data to assess the living arrangements and health status of elderly women in India. The IHDS is a jointly organised survey by researchers from the University of Maryland and National Council of Applied Economic Research, New Delhi. The data is open for public use. It is a nationally representative survey which was administered to 41,554 sample households across all the states and union territories of India, including a rural as well as urban sample. The survey has not only collected detailed information on household's income, education and other socio demographic indicators but also asked about the incidence of morbidity (short term and major morbidity) to all the members of the household and ability on conducting daily life activities to the members aged seven years and above. The three short term illnesses on which data is available are fever, cough and diarrhoea. Respondents were asked about whether any family member had suffered with any of these illnesses in the last month. For major morbidity information, only illnesses that were diagnosed medically were asked about. Respondents were asked about whether any family member was diagnosed with diabetes, hypertension, cancer, asthma, polio, cataract, tuberculosis or other long term illness. For the present study the sample size is restricted to elderly women only. In India, most of the demographers define 'elderly' as a person who is of age 60 years and above. Hence, the study analyses a total of 8,941 women in this age category.

Health status among elderly women has been defined based on self perceived short term illness in the last month and based on any diagnosed major morbidity. Living arrangements among the elderly have been assessed based on four mutually exclusive categories of living status. They are: living alone, living with spouse only, living in joint families (i.e living with son-daughter, child in law, father/mother, brother sister) and living with other relatives. Other socio- demographic variables that have been included in this study are: age (60-64, 65 - 74 and 74+), caste (general, other backward classes, schedule castes, schedule tribes), place of residence (rural, urban), education or schooling (0-4, 5-10 and 10 years and above), marital status (currently married, currently not married), working status (working, not working), household economic status (poor, non-poor). Household economic status (i.e poor and non-poor) has been calculated using monthly consumption per capita and official planning commission poverty line as of 2005. Both bivariate and multivariate techniques have been applied in this study. Bivariate cross tabulation is used to understand the living arrangement and morbidity prevalence by socio-demographic characteristics among elderly women in India. Binary logistic regression model is used to examine the net effect of living arrangements on health status among elderly women in India.

Result

Differentials in Living Arrangements:

Table 1 represents the living arrangement status among elderly women in India by their socio demographic characteristics. In India, the majority of elderly women (83%) live in joint families whereas four percent are living alone and six percent living with other relatives. Women's age is found to be a significant determinant of living arrangements. In young old age (60-64), 85 percent women are living in a joint family, three percent are living alone, 10 percent are living with spouse only and four percent living with other relatives. But, in the oldest age (74+), 82 percent of women are living in joint families and more than 13 percent of women are living with other relatives. Among the entire caste group, the higher proportion of elderly women among OBC (5 %) and ST (4%) are living alone. In urban areas, elderly women living in a joint family are comparatively higher (84%) than rural counter parts (82%). It is an indication that nowadays, urban areas are costly places to

Table 1: Living Arrangements of Elderly Women by Socio Background Characteristics in India

Socio- Demographic Characteristics	Living Arrangement				
	Living Alone	Spouse Only	Joint Family	Others Relatives	N
Age					
60 - 64	2.91	8.95	84.61	3.53	3202
65 - 74	4.89	7.96	81.46	5.68	3997
74 +	2.83	2.13	81.62	13.43	1742
Castes/Tribes					
General	2.57	7.22	83.83	6.38	3615
Other Backward Classes	4.57	8.15	81.21	6.07	3137
Schedule Castes	4.38	6.24	83.58	5.80	1634
Schedule Tribes	4.42	4.73	81.11	9.75	555
Residence					
Rural	4.09	7.57	82.37	5.96	6320
Urban	2.76	6.12	83.53	7.59	2621
Education (in years)					
0 -4	3.80	6.81	82.74	6.65	7713
5 - 10	3.84	8.42	83.41	4.33	1071
10 +	1.76	23.09	71.35	3.80	157
Current Marital Status					
Married	0.25	16.68	81.26	1.80	3893
Others*	6.46		83.71	9.83	5048
Current Working Status					
Not Working	3.18	6.21	82.92	7.69	6670
Working	5.44	10.08	81.89	2.59	2271
Household Economic Status					
Poor	4.11	8.21	81.40	6.28	7049
Non Poor	2.65	3.95	86.80	6.61	1892
Total	3.77	7.22	82.65	6.36	8941

live and many of the couples may prefer to stay in a joint family with their parent. In urban areas, particularly in the metropolitan cities, when both the couple are earning members of the family, in that case presence of an elderly person at home has an advantage for taking care of home as well as of kids. For elderly women who are currently not married among them nearly six percent are living alone and 10 percent of women are living with other relatives. Five percent among the working elderly women are living alone and 10 percent of them are living with a spouse whereas only three percent of non working elderly women are living alone and six percent of them living with spouse. Eighty seven percent of women from non-poor households are living in a joint family whereas among poor households 81 percent are living in a joint family setting.

Health Status and Morbidity Prevalence among Elderly Women:

Table 2 (opposite page) presents the morbidity prevalence among elderly women by their living arrangements and other socio demographic characteristics. Results show that prevalence of both short term morbidity (44 %) and major morbidity (38%) are higher for those women who are living alone. Prevalence of short term morbidities is found to be highest in the 60-64 years age group whereas major morbidity prevalence is found to be maximum in the older age groups. Short term morbidity is found to be higher among OBC (14%) and SC (14%) women but major morbidity prevalence is highest among general category women (25%). Rural elderly women are showing a higher prevalence (15%) in short term morbidity than urban counter parts but major morbidity is higher among urban women (27%) than rural. Twenty seven percent among the not working elderly women are suffering from a major morbidity while the figure for working women is 16 percent. Women from poor household are showing higher prevalence in both short term (41%) and major morbidities (22%).

Table 3 (page 34) shows rural-urban differences in health wellbeing, in terms of short term and major morbidity, among elderly women in India. Results depict that among all three short term morbidities fever is the most frequent for elderly women. Nearly 11 percent of women have suffered from fever in the last month and rural - urban differences are 13 percent and 7 percent respectively. High Blood Pressure (BP) has the highest burden among all the major morbidity in India (7.4 %), followed by cataract (4.8%), other morbidity (4.7%), diabetes (3.3 %) and asthma (3.2%). Prevalence of High BP is much higher in urban areas (11.9 %) than rural areas (5.9%). Results show that diabetes is an emerging disease in India, especially in urban India. In urban areas diabetes is the second highest prevalent disease after high BP. More than six percent of elderly women in urban India are suffering from diabetes.

There is state level variation in the prevalence of morbidity among elderly women in India (Figure 1 & Figure 2). Prevalence of any major morbidity among elderly women is found to be highest in Kerala (41%), followed by Jammu and Kashmir (34%), Bihar (29%) and Andhra Pradesh (24%). On the other hand, prevalence of any short term morbidity is found to be highest in Nagaland (46%), followed by Manipur (28%) and Uttaranchal (21 %).

Apart from the morbidity and illness, disability among the elderly also influences their health status and wellbeing. Risk of disabilities increases with the age of elderly. Indian Human Development Survey collected information on disability of daily life activities. Figure 3 (page 36) clearly shows that

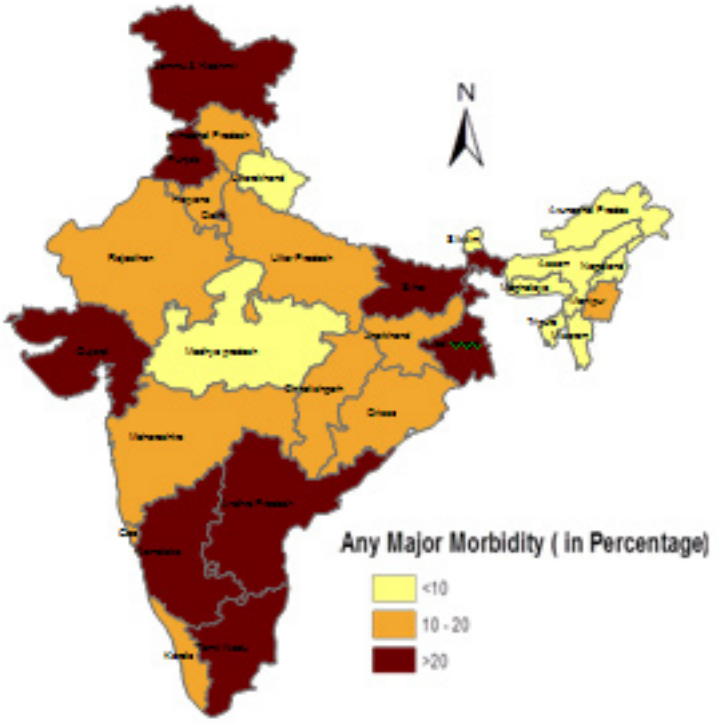

Figure 1: Percentage of Elderly Women suffering from any Major Morbidity in India

problems with eye sight and walking difficulties are the two major disabilities in daily life activities among elderly women and the risk increases with age. More than 10 percent of women of 74+ age are facing problems in eye sight as well as in walking difficulties, whereas among 60-64 aged women only six percent are suffering with eye sight problems and four percent are suffering with walking difficulties.

Result from Multivariate Analysis:

Binary logistic regression model has been applied to understand the effect of living arrangements on elderly health status (Table 4). Here, dependent variables are presence of any short term morbidity and presence of any major morbidity which have been coded as a binary form (i.e. No=0 and Yes=1). Two models have been applied for each of the dependent variables. In the first model, only living arrangement is considered as the independent variable. But in the second model, along with living arrangement other socio demographic variables have been controlled. Results show that when other variables are held constant, living arrangement has a significant effect on health and wellbeing of the elderly. Elderly women living with spouse are 51 percent less likely to suffer with any short term morbidity than women who are living alone. Again, women who are living in a joint family and women living with other

Living Arrangement and Socio-Demographic Characteristics	Morbidity Prevalence among Elderly		N
	Short term Morbidity[1]	Major Morbidity[2]	
Living Arrangement			
Living Alone	44.38	37.70	301
Living with spouse only	22.91	28.29	607
Living in Joint Family	11.26	18.84	7510
Living With Other relatives	7.67	16.37	523
Age			
60 - 64	14.57	19.66	3202
65 - 74	12.77	20.43	3997
74 +	11.10	20.06	1742
Caste			
General	11.5	25.0	3615
Other Backward Classes	14.3	19.5	3137
Schedule Castes	14.0	16.0	1634
Schedule Tribes	12.5	6.2	555
Residence			
Rural	14.59	17.96	6320
Urban	8.51	26.71	2621
Education (in years)			
0 -4	13.74	18.35	7713
5 - 10	8.71	32.49	1071
10 +	8.17	32.87	157
Current Marital Status			
Married	13.43	19.01	3893
Others*	12.89	20.89	5048
Current Working Status			
Not Working	11.42	21.50	6670
Working	17.91	16.06	2271
Household Economic Status			
Poor	13.64	22.43	7049
Non Poor	11.38	12.26	1892
Total	13.12	20.08	8941

Table 2: Prevalence of Morbidity among elderly women by their living arrangement and socio-demographic characteristics in India

Rank	Total		Rural		Urban	
	Morbidity	Percent	Morbidity	Percent	Morbidity	Percent
SHORT TERM MORBIDITIES						
1	Fever	11.5	Fever	12.9	Fever	7.1
2	Cough	9	Cough	10	Cough	5.8
3	Diarrhoea	2.7	Diarrhoea	3.1	Diarrhoea	1.5
MAJOR MORBIDITIES						
1	High BP	7.4	High BP	5.9	High BP	11.9
2	Cataract	4.8	Cataract	4.7	Diabetes	6.5
3	Others Morbidity	4.7	Others Morbidity	4.6	Others Morbidity	5.1
4	Diabetes	3.3	Asthma	3.5	Cataract	4.9
5	Asthma	3.2	Diabetes	2.3	Heart Disease	3.7
6	Heart Disease	1.7	Heart Disease	1	Asthma	2
7	Paralysis	0.7	Paralysis	0.7	Paralysis	0.7
8	Tuberculosis	0.6	Tuberculosis	0.6	Tuberculosis	0.6
9	Leprosy	0.2	Polio	0.2	Leprosy	0.4
10	Epilepsy	0.2	Mental Illness	0.2	Epilepsy	0.3
11	Polio	0.2	STD or AIDS	0.2	Polio	0.2
12	Mental Illness	0.2	Leprosy	0.1	Mental Illness	0.2
13	Cancer	0.1	Epilepsy	0.1	Cancer	0.2
14	STD or AIDS	0.1	Cancer	0.1	STD or AIDS	-

Table 3: Rural-Urban differences in morbidity burden among elderly women in India

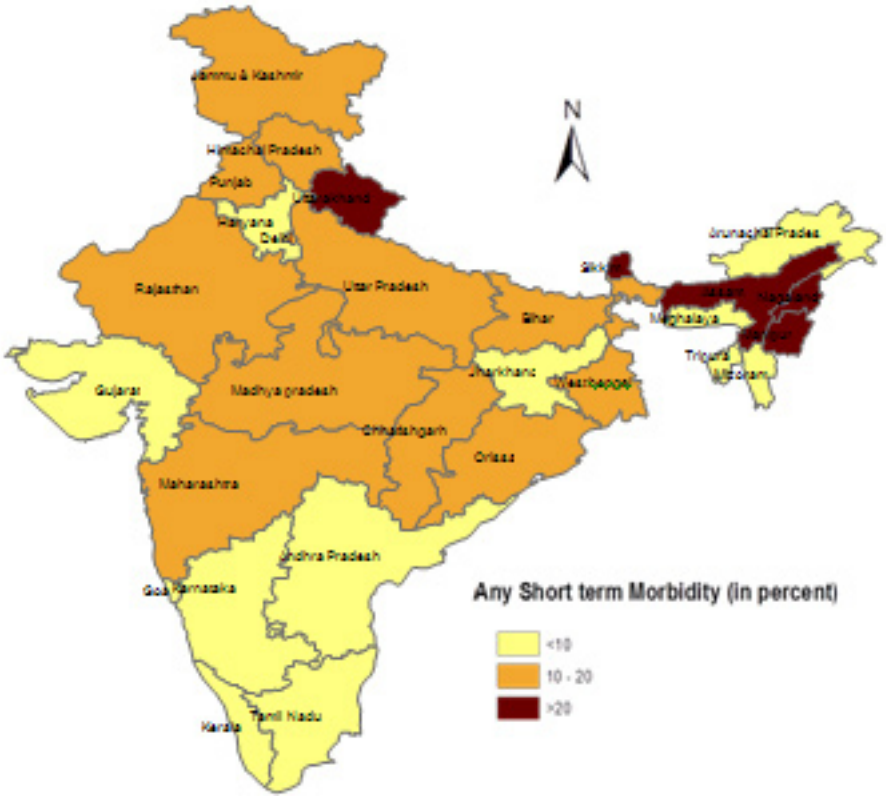

Figure 2: Percentage of Elderly Women Suffering from Short term Morbidity in India

Explanatory Variables	Short Term Morbidity		Major Morbidity	
	Model 1	Model 2	Model 1	Model 2
	EXP (B)	EXP (B)	EXP (B)	EXP (B)
Living Arrangement				
Living Alone ®				
Living with spouse only	0.364**	0.39**	0.631*	0.634**
Living in Joint Family	0.189**	0.201**	0.468**	0.443**
Living With Other relatives	0.132**	0.141**	0.384**	0.343**
Age				
60 - 64®				
65 - 74		0.959		1.077
74 +		1.027		1.044
Caste				
General ®				
Other Backward Classes		1.000		0.83**
Schedule Castes		1.041		0.702**
Schedule Tribes		0.798		0.346**
Residence				
Rural ®				
Urban		0.71**		1.405**
Education (in years0				
0 -4 ®				
5 - 10		0.714*		1.584**
10 +		0.69		1.332
Current Marital Status				
Married ®				
Others*		1.058		1.17*
Current Working Status				
Not Working ®				
Working		1.27*		0.77**
Household Economic Status				
Poor ®				
Non Poor		0.92		0.619**
Constant	0.663	0.669	0.52	0.548
Cox and Snail R Square	0.21	0.28	0.005	0.4

Table 4: Odds ratio showing effect of living arrangements on health well being among elderly women in India.

relatives are also 80% and 86 % respectively less likely to suffer with any short term morbidity compared to women living alone. Urban elderly women are 29 percent less likely to suffer with short term morbidity than rural counter parts. Living arrangement also has significant influence on the prevalence of major morbidity among elderly women. Results confirm that when other variables are controlled, women living with spouse only are 37 percent, women living with joint family are 56 percent and women living with other relatives are 66 percent less likely to suffer with any major morbidities compared to women who are living alone. Chances of major morbidities are lower for OBCs, SCs and STs groups than General caste group. Women residing in urban areas are 40 percent more likely to suffer from any major morbidity.

Conclusion

In India, a large number of elderly women are living alone, especially women from deprived socio economic groups which make them more vulnerable. Our results from multivariate analysis also support that women who are living alone are more likely to suffer with health morbidity. High Blood Pressure (BP) is the major concern of health well being among elderly women in urban as well as in rural areas. Another emerging major morbidity among elderly women, particularly in urban areas, is diabetes. In terms of prevalence, it holds second position in urban India. Nearly six percent of elderly women in urban areas are suffering from diabetes. The prevalence of life style related diseases like high BP and diabetes are on the increase. Therefore, they need to be controlled by making preventive and curative case access to elderly women. Ensuring wellbeing and managing living arrangements for

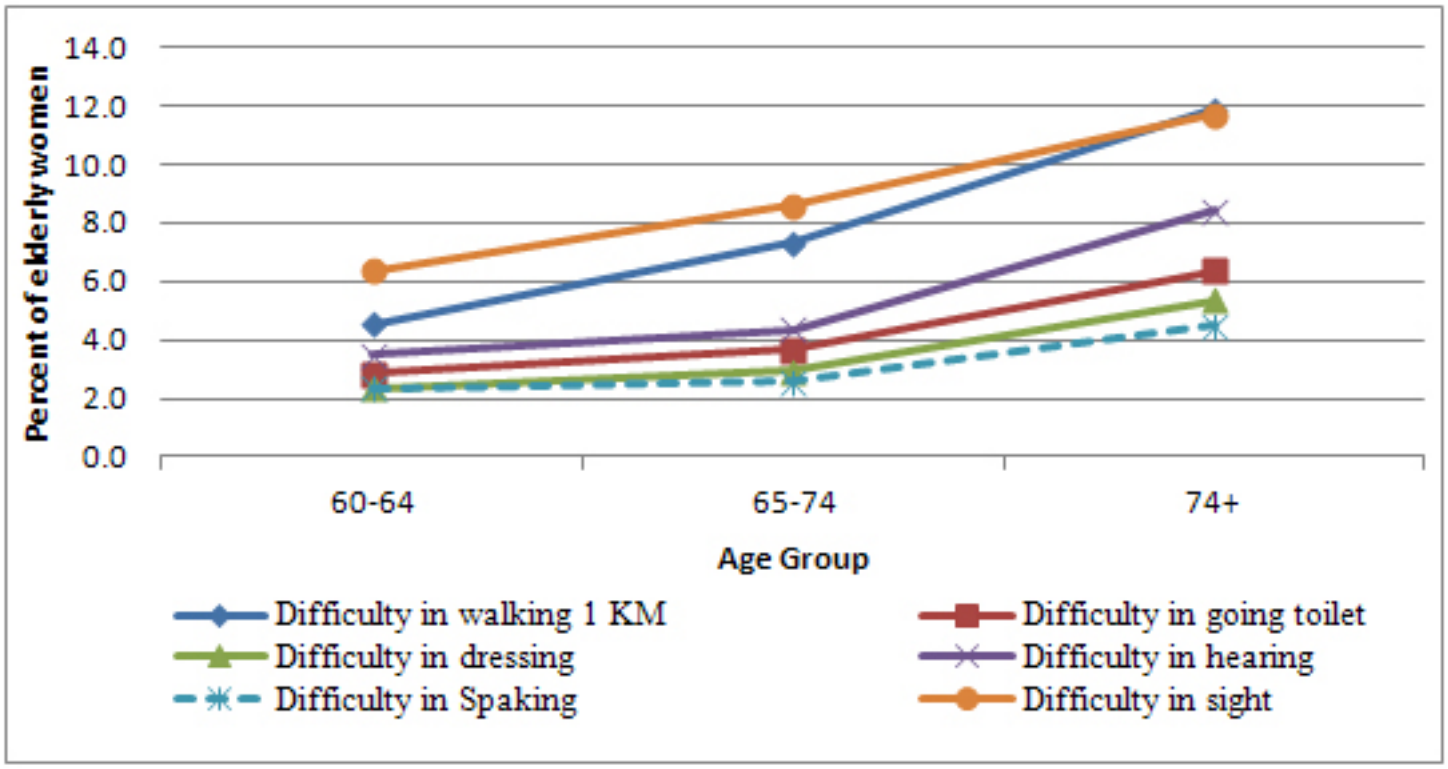

Figure 3: Difficulties among elderly women in Daily Life Activity

elderly are the emerging concern in the third would countries. The Government policy, which addresses the older population, should focus on widowed, disabled and women living alone. India's population policy (2000) has a commitment to address the concerns of elderly. The National Policy for Senior Citizen 2011 has given importance to the oldest old and female population, especially widowed and disabled women. However, the implementation of these policies is needed for enhancing knowledge and awareness of their rights and universal utilization of provisions made for them. Otherwise, all schemes and programmes will remain as a documentary exercise only.

References

1. Irudaya Rajan S. Population Ageing and Health in India. The Centre for Enquiry into Health and Allied Theme (CEHAT), Mumbai, 2006.
2. National Sample Survey Organization (NSSO). The Aged in India: A Socio-economic Profile -52nd round. New Delhi, 1998.
3. Ramamurti PV, Jamuna D. Handbook on Indian Geronotology. New Delhi, Serial Publication, 2004.
4. Kamo Y, Zhou M. Living Arrangement of Elderly Chinese and Japanese in the United States. Journal of Marriage and Family 1994; 56(3);544-588.
5. Palloni A. Living Arrangement of Older Persons. Population Bulletin of the United Nations. 42(43); 54-110.
6. United Nations. Reports of the Second World Assembly on Ageing. Publication A/CONF. 197/9. New York; 2005.
7. Yadav KNS, Yadav SS, Sharma CLN. A Study of Socio economic Factors and Behavioural Problems of the Aged Persons in Rural Northern India. Demography of India. 25(1); 21-34.
8. Jaiprakash I. Ageing in India. Report submitted to World Health Organization, Geneva, 1999.
9. Velkoff VA. Arrangement and Well being of the Older Population: Future Research Direction. Population Bulletin of the United Nations; 42(43); 376-385.
10. Munsur MA, Tareque IM, Rahaman MMK. Determinants of Living Arrangements, Health Status and Abuse among Elderly Women: A Study of Rural Naogaon District, Bangladesh. Journal of International Women's Studies 2010; 11(4); 162 - 167.
11. Mba CJ. Population Ageing and Survival Challenges in Rural Ghana" Journal of Social Development in Africa 2004; 19(2); 90-112.
12. Mba CJ. Racial Differences in Marital Status and Living Arrangements of Older Persons in South Africa. Generations Review 2005; 15(2); 23-31.
13. Abedin S. Living and care arrangements of the elderly in Bangladesh. In. Kabir M, eds. The elderly-contemporary issues, Dhaka Presidency Press, Dhaka, 2003; 100-107.
14. Kabir M, Haque M, Chaklader H. Mainstreaming ageing in health: will it be possible. Paper presented in the International conference on Mainstreaming ageing in health system and rural development, Held in Dhaka 2005, November, 29 - 30.

The study of potential drug drug interactions among older patients admitted to theintensive care unit in Kerman, Iran

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ABSTRACT

Introduction: Critically ill patients are at higher risk of drug-drug interaction. They have many risk factors that may develop potential drug interactions. The aim of the research was to determine the prevalence of potential drug interactions among older patients who were admitted to the intensive care unit.

Materials and Method: In this cross sectional study, data about all older patients who were admitted to the intensive care unit from January 1 to December 31, 2011 were detected from medical records. The extent of occurrence and number of potential drug interactions were investigated based on the reference textbook Drug Interaction Facts. All data were analyzed using SPSS 18·00 statistical software.

Results: 77 different drugs and 394 drug prescriptions were determined with a mean of 5.6 (SD=1.5) for each patient. A total of 108 potential drug interactions were found in the first twenty-four hour prescriptions. The largest form of potential drug interactions was delayed, moderate and possible. Results showed a correlation between number of potential drug interactions with number of prescribed drugs($r = 0.563$, $p < 0.05$). Although mean of drug interactions in women were more than that among men, independent T-test showed no significant difference between gender and mean number of drug interactions ($p > 0.05$)

Conclusion: Older patients who are admitted to intensive care units are at high risk of potential drug interactions, so they need to be more considered by health care team members.

Key words : Older patients, Intensive care unit, Drug interaction

Introduction

A potential drug interaction refers to the possibility of a drug changing the effect of another drug administered simultaneously (1). In terms of mechanism, drug interactions are often characterized as being either pharmacokinetic or pharmacodynamics (2). According to Papadopoulos et al, a pharmacokinetic interaction occurs when one drug alters the absorption, distribution, metabolism, or elimination of another drug (3). They further state that a pharmacodynamic interaction occurs when one drug changes the pharmacologic response of another drug in an additive, synergistic or antagonistic way (3). Although all potential drug interactions may not cause actual drug interactions, if the rate of potential drug interactions and most important risk factors for it are recognized, the actual drug interactions would be prevented.

Drug interaction occurrence and its severity depend on numerous factors, such as number of drugs prescribed, length of treatment, patient age and stages of disease (4). Patients in intensive care units are at higher risk for drug interactions. They have many risk factors that may develop potential drug interactions (2,5,6). Some authors suggest that even if many patients use potentially interacting drugs, the real risk related to these associations seems to be low or moderate (7,8). On the other hand, other authors suggest that potential drug interactions are a major cause of adverse drug reactions (9). Lima et al, assessed potential drug interactions in a Brazilian intensive care unit (5). They showed that risk of potential drug interactions among critically ill patients is high (5). Hammes et al. examined potential drug interactions in intensive care units (4). They reported 188 different potential drug interactions among critically ill patients (4). Nazari et al assessed pharmacokinetic drug interactions in Iranian intensive care units. They indicated that potential drug interactions among critically ill patients are high (2). In India, Ray et al surveyed potential drug interaction among 400 critically ill patients admitted to an intensive care unit. They reported that drug interaction is common in the intensive care unit population (10). Almeida et al attempted to quantify and classify drug-drug interactions among critically ill patients. They reported that potential drug interactions are very common in the intensive care unit. They emphasized that it may negatively affect the patients' economic and clinical situation (1).

Based on Foreman, a large number of critically ill patients are older patients (11). They continued that patients older than 65 years currently consisted of 42% to 52% of admission to the intensive care units and 60% of all ICU days (11). Currently, morbidity, mortality and increase in costs related to adverse drug events are a significant challenge among older adults who are admitted to intensive care wards. Previous studies focused on prevalence of drug interaction among older adults and they reported that older adults are at high risk for drug interaction development. For example, Locatelli et al assessed prevalence of potential drug interaction among hospitalized older patients in Brazil (12). They found that risk of drug interactions in this group of patients is high. In reviewing literature, no research was found that studied drug interactions among elders admitted in ICU (12). This study thus was aimed to examine the prevalence of potential drug interactions among critically older patients. It also aimed to assess factors that may affect drug interactions among this group of patients.

Materials and Method

The study used a descriptive cross sectional design. Protocol for the research project has been approved by a suitably constituted Ethics Committee of Kerman Medical University. The study was conducted in one hospital with 30 intensive care unit beds. Data about all older patients who were admitted to the intensive care unit from January 1 to December 31, 2011were derived from medical records. All subjects gave informed consent and patient anonymity was preserved.

Patients were divided into three group: young old (ages 65-74), the middle old (ages 75-84) and very old (ages 85 and up) (13). Total drugs that were prescribed in the twenty-four hours after admission to the intensive care unit were extracted and all possible paired combinations of drug-drug were recorded. Nutritional supplements, hydro-electrolytic components, insulin and vitamins were excluded. Demographic information included age, gender and number of prescribing physicians, obtained from medical records. The extent of occurrence and frequency of potential drug interactions were investigated based on the reference textbook Drug Interaction Facts published in 2010 (14). Potential drug interactions identified in this textbook were classified by

Severity

(Minor: "the effects are usually mild; consequences may be bothersome or unnoticeable but should not significantly affect the therapeutic outcome. Additional treatment is usually not required",
Moderate: "the effect may cause deterioration in a patient's clinical status. Additional treatment, hospitalization or an extended hospital stay may be necessary",
Major: "the effects are potentially life threatening or capable of causing permanent damage"),

Onset of action

(Rapid "the effect will be evident within 24 hours of administration of the interacting drug", Delayed: "the effect will not be evident until the interacting drug is administered for a period of days or weeks") and

Documentation

(Established: "proven to occur in well controlled studies",
Probable: "very likely but not proven clinically",
Suspected: "may occur; some good data; need more study",
Possible: "could occur but data are limited",
Unlikely: "doubtful; no good evidence of an altered clinical effect").

All data were analysed using SPSS 18·00 statistical software and a variable was found to be statistically significant if $P < 0{\cdot}05$. Descriptive statistics, Pearson correlation test, independent T- test and ANOVA were used.

Results

During a year, 371 patients were admitted to Shahid Bahonar intensive care units. Of them, 70 patients were older than 65 years. Half of them were men and the other half were women. The mean age of patients was 74±5.9 years. Of the patients, 48.6% were aged between 65 to 74 years, 41.4% were aged between 75 to 84 years and 10% were aged ?84 years. Mean number of physicians for each patient was 2.8. Mean of intensive care unit stay were 17.5±17.7 days. Of 70 patients, more than half died (54.3%).

Drug name	Number of prescriptions	Drug name	Number of prescriptions
Phenytoin	44	Pantoprazole	20
Ranitidine	43	Cefalotine	18
Vancomycin	35	Dexamethasone	18
Ceftazidime	35	Ceftriaxone	13
Morphine	30	Nitroglycrin(TNG)	12

Table 1: Ten most common prescribed drugs

	Major	4	3.70%
Severity	Moderate	89	82.40%
	Minor	15	13.88%
	Rapid	11	10.8%
Onset of action	Delayed	95	89.2%
	Established	21	19.44%
	Probable	5	4.62%
Documentation	Suspected	24	22.22%
	Possible	52	48.14%
	Unlikely	7	6.48%

Table 2 : Drug interactions classified by severity, onset of action and documentation

In total, 77drugs with 394 prescriptions were identified in examined medical records. Mean of drug number for patients was 5.6±1.4. The antibiotics group were more consumed than others. The most prescribed drugs were phenytoin (with 44 prescriptions) and ranitidine (with 43 prescriptions). The names of the ten most prescribed drugs are shown in Table 1. Of 394 consumed medications, 342 drugs were administered intravenously.

In total 108 potential drug interactions were identified. More forms of potential drug interactions were delayed, moderate and possible (Table 2). Higher numbers of potential drug interactions were between ranitidine and phenytoin with 38 interactions. Of 108 potential drug interactions, 4 interactions were major interactions. The major interactions were between 1) midazolam and methadone, 2) furosemide (Lasix) and Amikacine, 3) phenytoin and dopamine, and 4) heparin and aspirin. Pierson correlation test showed that there is a significant correlation between number of potential drug interactions and number of prescribed drugs ($r = 0.565$, $p < 0.001$). No significant correlation was found between number of potential drug interactions and number of physicians who prescribed drugs for patients ($p > 0.05$). Also no correlation was found between number of interactions and mean of intensive care unit stays ($p > 0.05$). Although mean of drug interactions in women was higher than that among men, independent T-test showed no significant difference between gender and mean number of drug interactions ($p > 0.05$). Results of ANOVA indicated no significant difference between age and mean number of drug interactions ($p > 0.05$).

Discussion

The purpose of this study was to determine the prevalence of potential drug interactions among elders admitted to the intensive care unit. According to the findings, rate of prevalence

of potential drug interactions among this group of critically ill patients was high. Similarly, the results of most previous studies that assessed all patients in intensive care units showed that patients in these wards are at high risk of drug interactions (1,2,5,15). No study was found that especially examined the risk of potential drug interactions among older adults in an intensive care unit. Lima et al assessed 102 critically ill patients and found 311 potential drug interactions. They reported that patients older than 60 years are at higher risk for drug interaction compared to the younger ones (5). They also asserted that drug interactions are more frequent among patients older than 60 years because they suffer from chronic disease that needs multidrug therapy (5). Results of the present study showed that most forms of potential drug interactions among patients in intensive care units were delayed, moderate and possible. Interaction between ranitidine and phenytoin which approximately composed one third of total interactions is delayed, moderate and possible. So it is rational that most forms of interactions found in the present study be delayed, moderate and possible. Consistently, Hammes et al found that 59.7% of potential drug interactions in the intensive care unit are delayed. They also reported that rate of moderate and possible interactions is higher than other forms of interactions among critically ill patients (4). According to the results, approximately one third of total interactions were interactions between ranitidine and phenytoin. Ranitidine is a specific histamine H2-antagonist that inhibits basal and stimulated secretion of gastric acid, reducing both the volume and the pH of the secretion (16). More than 75 % of patients who were admitted to the intensive care unit are at risk of stress ulcer development. Ranitidine is used for prophylaxis of stress ulceration in critically ill patients (17). Phenytoin is an anticonvulsant drug that is used for treatment of status epilepticus and prophylaxis for convulsants in the intensive care unit (16,18). Interaction formed between ranitidine and phenytoin is delayed, moderate and possible. In Iranian intensive care units, usually ranitidine and phenytoin are used intravenously (IV). Therefore, risk of actual drug interaction development increases with use of ranitidine and phenytoin simultaneously.

Results of the present study also showed that increase in numbers of prescribed drugs causes increase in number of drug interactions. Likely, Nazari et al who assessed pharmacokinetic drug interactions in intensive care units found a direct relationship between number of medication entries in prescriptions and frequency of potential drug interactions (2). Similar findings are reported by others (1,4). According to the findings, risk of potential drug interactions among men and women patients was similar. Lima et al reported that women are at higher risk for potential drug interactions than men (5). They reported that female patients are at higher risk for potential drug interactions because most participants were women (5). In the present study, it is found that increase in physician numbers who prescribed drugs for patients may cause increase in rate of potential drug interactions. Critically ill patients have more clinical problems compared to the patients admitted in other wards and need to be more visited by a higher number of physicians. Increasing number of physicians who visited patients in intensive care unit may increase the number of prescribed drugs, and consequently increased rate of potential drug interactions. In 394 prescriptions, most drugs were administered intravenously (86.8%). Our finding is consistent with other studies (1,5). Results of the Lima et al study showed that most drugs in the intensive care unit are administered intravenously (5). They reported that for critically ill patients who should receive their drugs rapidly; intravenous is the best way to achieve this purpose (5). Additionally, most elder critically ill patients are unable to receive drugs orally and intravenous prescriptions provide a possibility for patients to receive larger amounts of drug compared to the other ways (19). It also provides immediate access to the circulatory system and meets the need of drugs infusion.

Conclusion

Our findings indicated that prevalence of potential drug interactions among older adults who were admitted to the intensive care unit is high. Factors such as, increased number of prescribed drugs, increased number of physicians who prescribed drugs, multidrug therapy, severe clinical conditions and use of intravenous route for drugs administration may cause an increase in rate of drug interactions among critically ill older patients. In order to reduce the number of potential drug interactions, physicians should be aware of the presence of potential drug interactions. Nurses also have an important role to decrease rate of drug interactions because they usually determine time of drug administration. Although not all drug interactions are preventable, health care education about the main risk factors for drug interactions, and mechanisms of interaction may decrease the rate of drug interactions. The limitation of this study was mostly due to the retrospective design of it. To better quantify the clinical relevance of potential interacting drug combinations during intensive care unit stay, a prospective design would be necessary. Drugs that are not registered in the fact text book were considered as without potential drug interaction, therefore prevalence of potential drug interaction may have been underestimated.

Relevance to clinical practice:

Providing information about the most common drug interactions that are clinically relevant is important to prevent drug interactions. This educations may help health care staff to choose therapeutic regimens and drug administration times that are safe for critically ill older patients in order to prevent the side effects of drug interactions and consequently enhance quality of care for older adults in the ICU.

References

1 - Almeida S M, Gama C S, Akamine N. Prevalence and classification of drug-drug interactions in intensive care patients. einstein. 2007; 5:347-51

2 - Nazari M A, Moghadam N. Evaluation of Pharmacokinetic Drug Interactions in Prescriptions of Intensive Care Unit (ICU) in a Teaching Hospital. Iranian Journal of Pharmaceutical Research. 2006; 3: 215-18

3 - Papadopoulos J, Smithburger P L. Common drug interactions leading to adverse drug events in the intensive care unit: Management and pharmacokinetic considerations. Crit Care Med. 2010; 38:126-35

4 - Hammes J A, Pfuetzenreiter F, Silveira F D, Koenig A, Westphal A G. Potential drug interactions prevalence in intensive care units. Rev Bras Ter Intensiva. 2008; 20:349-54

5 - Lima F E, Cassiani S H. Potential drug interaction in intensive care patients at a teaching hospital. Rev Latino-am Enfermagem. 2009; 17:222-7
6 - Reis AM, Cassiani SH. Prevalence of potential drug interactions in patients in an intensive care unit of a university hospital in Brazil. Clinics. 2011;66:9-15
7 - Egger SS, Drewe J, Schlienger RG. Potential drug-drug interactions in the medication of medical patients at hospital discharge. Eur J Clin Pharmacol. 2003; 58:773-78
8 - Becker ML, Kallewaard M, Caspers PW, Visser LE, Leufkens HG, Stricker BH. Hospitalizations and emergency department visits due to drug-drug interactions: a literature review. Pharmacoepidemiol Drug Safe. 2006; 16:641-51
9 - McDonnell PJ, Jacobs MR. Hospital admissions resulting from preventable adverse drug reactions. Ann Pharmacother. 2002; 36: 1331-36
10 - Ray S, Bhattacharyya M, Pramanik J, Todi S. Drug-drug interactions in the ICU. Critical Care; 2009:17:495
11 - Foreman MD, Milisen K, Fulmer TT. Critical Care Nursing of Older Adult. 3rd ed. New York, Springer publishing company. 2010: 267-84
12 - Locatelli J. Drug interaction in hospitalized eldrly patients. einstein. 2007; 5:343-346
13 - Mauck KL. Gerontological Nursing. Boston, Jones and Bartlett publishers. 2006: 7
14 - Tatro D S. Drug Interaction Facts. St Louis, Walters Kluwer Health. 2010
15 - Rafiei H, et al. The prevalence of potential drug interaction in intensive care unit. Iranian Journal of Critical Care Nursing. 2012; 4:191-96
16 - Paw HGV, Shulman R. Handbook of Drug in Intensive Care. Cambridge University Press .Cambridge. 2010:181-95
17 - Marino P L. The ICU Book. 3rd ed. New York, Lippincott Williams & Wilkins. 2007:67
18 - Brunton LL, Parker KL. Manual of Pharmacology and Therapeutics. Mc Graw Hill. New York. 2008: 432
19 - Abram AC, Pennington SS, Lammon CB. Clinical Drug Therapy. Lippincott Williams & Wilkins. Philadelphia. 2009:25

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