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Effects Of Antihypertensive And Cardiac Drugs And Level Of Depression In Community-Based Elders

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Effects of Antihypertensive and Cardiac Drugs and

Level of Depression in Community-Based Elders

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Abstract

The purpose of this ex post facto study was to determine the effects of antihypertensive and cardiac drugs on the level of depression in community-based elders. Roy's Adaptation Model provided the theoretical framework for this study. Data were collected using the Brink Geriatric Depression Scale and the Drug Information Sheet. These questionnaires were administered to 40 subjects ages 55 and older who were taking antihypertensive and/or cardiac drugs or neither antihypertensive nor cardiac drugs.

One null hypothesis and five directional hypotheses guided this study. The null hypothesis stated that there would be no difference in mean depression scores among the following groups: (a) elders taking neither antihypertensive nor cardiac drugs, (b) elders taking antihypertensive drugs alone, (c) elders taking cardiac drugs alone, and (d) elders taking a combination of antihypertensive and cardiac drugs. Utilizing the ANOVA, the result was significant at the .05 level. Thus, the researcher rejected the null hypothesis.

Directional hypotheses made the following comparisons of community-based elders: Elders who took antihypertensive drugs only and elders who took no drugs, elders who took

cardiac drugs only and elders who took no drugs, elders who took antihypertensive and cardiac drugs and elders who took antihypertensive drugs alone, elders who took antihypertensive and cardiac drugs and elders who took cardiac drugs alone, and elders who took antihypertensive and cardiac drugs and elders who took neither antihypertensive nor cardiac drugs. Utilizing the t test, the following comparisons were significant at the .05 level: Elders who took antihypertensive drugs only and elders who took no drugs, elders who took cardiac drugs only and elders who took no drugs, and elders who took antihypertensive and cardiac drugs and elders who took neither antihypertensive nor cardiac drugs.

The findings of this study indicate that elders who take antihypertensive and/or cardiac drugs experience a significantly higher level of depression as compared to elders who do not take antihypertensive or cardiac drugs. Pharmacotherapeutic depression may or may not result when antihypertensive and/or cardiac drugs are ingested. Perhaps, as a function of the aging process, depression may be experienced by all elders. Recommendations for further study include conduction of a similar study including chronic illnesses and level of depression and conduction of a study to determine effects of multiple medication ingestion and level of depression.

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Chapter I

The Research Problem

Elders constitute about 12% of the population and consume from 25% to 30% of all prescription drugs in the United States. Noninstitutionalized elders take an average of 5.6 drugs daily, and elders 60 years and over routinely ingest five or more medications each day (Hawranik & Kondratuk, 1989; Mullen & Granholm, 1981). These reports confirm the extensive drug use by the elderly population. The two major classes of pharmacologic agents most often prescribed for elders are cardiac and antihypertensive. Many of the drugs in these categories have the known side effect of depression which places the elder at risk to develop iatrogenically-induced depression. Since no research has examined the correlation of usage of selected pharmacologic agents and level of depression in elders, this study sought to determine if such a link existed.

Introduction to the Problem

Depression has been referred to as the common cold of elderly persons and has been reported as affecting from 10% to 70% of elders (Ebersole & Hess, 1985). At least 15% of all elders diagnosed as being depressed show signs of

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cognitive impairment and other indications of dementia placing them at risk for being misdiagnosed as senile. Misdiagnoses and mistreatment of depression in elders result in severe disability, such as immobility, fecal impaction, incontinence, clouding of consciousness, and even death (Breslau & Haug, 1983; Hawranik & Kondratuk, 1989).

Suicide, the most serious yet preventable consequence of depression, has an alarmingly high rate among the elderly population. Hawranik and Kondratuk (1989) found that 28% of all suicides are committed by people over the age of 60, and at least one half of those who committed suicide suffered from depression. The suicide rate for elderly males is the highest of any age group. Among males over the age of 80, the rate approaches 50 per 100,000 as compared to 10 per 100,000 for the general population (Kane, Ouslander, & Abrass, 1989).

Depression also affects the elder's functioning in performance of activities of daily living since depression depletes energy levels. When this depression is combined with feelings of low self-esteem, the elder is unable to mobilize enough energy to care for himself. The depressed elder may regress to the point of self-neglect and refuse to bathe, shave, or eat (Breslau & Haug, 1983).

The larger societal issue of depression in elders is never fully considered. Since many treatable depressed elders do not receive formal diagnosis and intervention,

they often become chronically depressed and disabled. The economic costs of long-term care for these people, whether in a nursing home or within the family setting, can become an enormous social burden (Breslau & Haug, 1983).

The connection between depression and prescription drugs was highlighted with the widespread use of the antihypertensive drug reserpine. Depression was recognized as a side effect of reserpine because of the high number of people who became depressed after taking this agent. Other antihypertensive drugs (clonidine, hydralazine, methyldopa, propranolol), benzodiazepines, levodopa, digitalis, indomethacin, corticosteroids, and phenothiazines have been reported to cause depression. These agents are some of the most commonly prescribed drugs for elderly persons. Other drugs that predispose the elder to psychiatric reactions, including depression, are female hormones and agents to treat Parkinson's disease, tuberculosis, and cancer (Breslau & Haug, 1983).

Of all drugs taken by elders, antihypertensive drugs are most likely to induce a true depression. Up to 20% of all elders treated with antihypertensive drugs manifest symptoms of depression including sadness, weakness, apathy, agitation, and insomnia (Breslau & Haug, 1983).

In summary, depression has been found to be a significant health problem in the elderly population. This population has been consuming large amounts of medications,

many of which have the side effect of depression.
Therefore, iatrogenically-induced depression may be common.
Consequences of depression included impaired cognitive
functioning, suicide, inability to perform activities of
daily living, and societal burden. Further research is
needed to assess level of depression and drug ingestion by
elders.

Significance to Nursing

The need for this study was based on the practice of
the Geriatric Nurse Clinician (GNC) who is in a unique
position to assess and manage depression in elders. The GNC
can prescribe medication for elders in collaboration with a
physician. Since certain drugs have the known side effect
of depression, discretion can be used in prescribing and
monitoring those drugs. These actions may then decrease
the incidence of depression in elders leading to a decrease
in health problems caused by depression, an overall
improvement in the health status of elders, and a better
quality of life for elders. The GNC also serves as teacher
and consultant to other health care providers by providing
them with the knowledge necessary in prescribing therapeutic
regimens designed to decrease the incidence of depression in
elders.

Theoretical Framework

Roy's Adaptation Model provided the necessary theoretical framework to assess and treat pharmacotherapeutic depression in the elderly. According to Riehl and Roy (1980), a positive response to a changing environment is the process of adaptation. Depression caused by medications indicates adaptation failure.

Man is viewed as a biopsychosocial being in constant interaction with a changing environment. The anatomical parts of man function physiologically to contribute to biological constancy of man. Man also has a psychologic nature. The biological system and the nervous system produce meaningful behavior. Therefore, behavior or biologic and psychologic constancy can be affected by environmental stimuli such as pharmacotherapeutic agents.

Environment may be defined as "all conditions, circumstances, and influences surrounding and affecting the development and behavior of persons or groups" (Fawcett, 1989, p. 314). One factor in the environment of elders is pharmacotherapeutic agents. Factors in the environment that affect the elder are focal, contextual, or residual stimuli. Pharmacotherapeutic agents are focal stimuli confronting the person.

Health is viewed as a continuum from maximum wellness to maximum illness. As the person moves along the continuum, adaptation problems are encountered. Health

results when the person adapts successfully to environmental demands. An adaptive response in general is behavior that maintains the integrity of the individual; thus, a maladaptive response is one that does not maintain the integrity of the individual. Depression is a maladaptive response that does not maintain the integrity of the individual. The person's coping mechanisms may be categorized as the regulator subsystem or cognator subsystem. The regulator mechanisms work mainly through the autonomic nervous system which readies the person for coping with stimuli by approach, attack, or flight. The cognator mechanisms identify, store, and relate stimuli so symbolic responses can be made. Depression could affect the regulator and cognator adaptive mechanisms. Pronounced autonomic activity with cognator ineffectiveness signals an adaptation failure. Thus, depression caused by pharmacotherapeutic agents, or iatrogenically-induced depression, signifies adaptation failure.

The focus of nursing, according to Riehl and Roy (1980) is on the person as a total being at a point along the health-illness continuum. Nursing is needed when unusual stresses or weakened coping mechanisms make the person's usual attempts to cope ineffective. The goals of nursing are to promote client adaptation in all four adaptive modes (physiologic, self-concept, role function, and interdependence) during health and illness. The physiologic

mode has as its basis man's need for physiologic integrity. The self-concept mode is composed of the physical self and the personal self. The role function mode and the interdependence mode are related to the need for social integrity. Man needs to know who he is in relation to others and what the expectations of society are regarding the position he holds so he can act appropriately. An internal or external change may affect more than one adaptive mode at a time. The complexity and interrelatedness of the total person must be kept in mind as the nurse views man. Therefore, depression affects man's functioning in all modes. Physiologic integrity is comprised, self-esteem is lowered, and role expectations and interdependence needs are not fulfilled (Fawcett, 1989; Marriner, 1986; Riehl & Roy, 1980).

Assumptions

This study was based on the assumption that iatrogenically-induced depression is a result of ingestion of antihypertensive and cardiac drugs, and depression is a syndrome that can be measured.

Statement of the Problem

This study addressed the question: What is the effect of antihypertensive and cardiac drugs on the level of depression in community-based elders?

<u>Research Hypotheses</u>

The research hypotheses that guided this study are as follows:

Ho: There will be no difference in mean depression scores among the following groups: Group 1--elders taking neither antihypertensive nor cardiac drugs, Group 2--elders taking antihypertensive drugs only, Group 3--elders taking cardiac drugs only, and Group 4--elders taking a combination of antihypertensive and cardiac drugs.

Ha_1: Community-based elders who take antihypertensive drugs will experience a significantly higher level of depression than elders who do not take antihypertensive and cardiac drugs.

Ha_2: Community-based elders who take cardiac drugs will experience a significantly higher level of depression than elders who do not take antihypertensive and cardiac drugs.

Ha_3: Community-based elders who take antihypertensive and cardiac drugs will experience a significantly higher level of depression than those elders taking antihypertensive drugs alone.

Ha_4: Community-based elders who take antihypertensive and cardiac drugs will experience a significantly higher level of depression than those elders taking cardiac drugs alone.

Ha_5: Community-based elders who take antihypertensive and cardiac drugs will experience higher level of depression than those elders taking neither antihypertensive nor cardiac drugs.

Definition of Terms

For the purpose of this research the following definitions were used:

Community-based elders: Those males and females 55 and older living in the community who are taking only antihypertensive drugs, only cardiac drugs, both antihypertensive and cardiac drugs, or neither antihypertensive nor cardiac drugs.

Antihypertensive drugs: Drugs taken to control blood pressure including antiadrenergics, peripheral vasodilators, beta-adrenergic blocking agents, and central alpha-adrenergic agonists.

Cardiac drugs: Drugs taken for any heart condition including coronary vasodilators, antidysrhythmics, and cardiac glycosides.

Level of depression: A syndrome consisting of lowered mood tone, difficulty in thinking, and somatic changes as measured by the Brink Geriatric Depression Scale (1983).

Chapter II

Review of the Literature

Although specific drugs have been identified as causing
the side effect of depression, only one study was found with
the specific purpose of identifying drugs that were
significantly related to depression. Therefore, the
emphasis of this literature review is the epidemiology of
depression in the elderly community.

Blazer and Williams (1980) conducted a descriptive
study designed to establish the prevalence of dysphoric
symptoms and the symptoms of major depressive disorders in
an elderly community population. The authors surveyed 997
elderly people living independently in the community. The
sample consisted of elders 65 and older, with the average
age being 74 years. Methods of data collection included
symptom checklists and interviews. The instrument used to
collect data was a checklist for dysphoric symptoms using
the operational criteria established by DSM-III for
psychiatric diagnoses.

Data were analyzed using frequency distributions. The
rate of significant dysphoric symptomatology was 14.7%.
Forty-five of these individuals suffered from dysphoric

symptoms only, and 37 had symptoms of a major depressive disorder. Eighteen suffered from symptoms of primary depressive disorder and 19 from symptoms of secondary depressive disorder. Of the 147 subjects with depressive symptoms, 65 (44%) had physical health impairment. The frequency of widowhood, impairment in social resources, and impairment in economic resources was greater for individuals with symptoms of a major depressive disorder.

The findings in this study confirm previous reports that the prevalence of depressive symptomatology is quite high among elderly persons in the community. However, the prevalence of the symptoms of primary depressive disorder, as operationally defined in DSM-III, was lower than expected.

Freedman, Bucci, and Elkowitz (1982) conducted a pilot study of 166 chronically ill family practice geriatric patients living in the community in order to assess the prevalence of depression in this group. The investigation was conducted in a single general practice facility through an agreement with a collaborating physician. The population consisted largely of first and second generations of Italian and Jewish descent. The physician was especially interested in geriatric medicine. His practice included a large population of patients 60 years or older who were seen on a regular basis. A survey of case records was conducted to determine the distribution of patients by age, sex, and

primary chronic illness. The two illnesses most frequently encountered in this practice were hypertension and arthritis. All subjects within the selected chronic disease categories were included in the sample. The study sample included 108 women and 58 men whose ages ranged from 60 to 86 years.

Assessment of depression was based on the Zung Depression Status Inventory (DSI), a 20-item semi-structured interviewer-rated inventory, administered by the physician. For the total sample visiting their family physician for a routine examination and without diagnosed psychiatric impairment, the mean DSI score was 49.8, while a fourth of the sample had DSI scores of 60 or above. According to Zung, DSI scores of 50 or above in the population at large may be interpreted as indicating the presence of a depressive psychopathologic disorder. A score of 50-59 is associated with minimal to mild depression, 60-69 with moderate to severe depression, 70 or above with severe depression, and lower than 50 with normal mental status.

Depressive symptom levels also were traced in successive age groups. Five successive age groups were considered, divided according to 5-year intervals from 60 years of age, with the eldest group including all subjects 80 years or older. Overall the data indicated a relationship between depressive symptoms and aging. Analysis of variance of the mean DSI totals showed an

overall sex effect, with females consistently showing higher mean scores [$F(3, 166) = 16.78$, $p = .001$]. There was a significant age-by-sex interaction [$F(3, 166) = 3.92$, $p = .005$] making it necessary to examine separately the patterns of depression in men and women. Significant age effects were found for both men [$F(3, 58) = 2.75$, $p = .04$] and women [$F(3, 108) = 2.62$, $p = .04$]. Women showed peak symptom levels in the 65- to 69-year age range and men in the subsequent 70- to 74-year age range (Freedman et al., 1982).

The major conclusion drawn from the study was that elderly community residents without recognized psychiatric impairment had a depression level similar to the borderline level indicating the presence of psychiatric illness among the population as a whole. Furthermore, a fourth of these elderly residents had DSI scores that would be classified as indicating moderate to severe depression; this proportion rose to more than half in the peak 65- to 69-year age range. A recommendation for further study was to use the general practitioner's office as a mental health screening locale.

Borson et al. (1986) assessed the prevalence of depressive symptoms in a primary care clinic in a Veterans Administration Medical Center. All patients aged 60 and over served by this clinic were selected for this study ($N = 917$). Each patient was mailed a consent form for participation, a demographic data checklist, and the Zung Self-Rating Depression Scale (SDS). A total of 447 (49%)

returned all three items. Forty-one patients were excluded from analysis due to incomplete data sets. Twenty-four percent of the total sample (99 of 406) scored above 60 on the SDS index. Index scores of 60 or greater are strongly suggestive of clinical depression in older populations. The SDS index score for the depressed group was 66.3 $\pm$ 4.4 (M $\pm$ SD), and for the nondepressed group, 43.8 $\pm$ 6.7.

The age range of the sample was 60 to 91 years. Fifty-eight percent of the patients were between 60 and 69 years of age, 23% were 70 to 79, and 19% were over 80. Mean SDS scores showed no significant age effects. Demographic variables that differentiated patients with high depression scores from those with low scores were marital separation or divorce (p = .008) and inability to work because of medical disability. Widowhood and voluntary retirement were less common in the depressed than in the nondepressed group (p < .01). Social isolation, as reflected by proportions of men who lived alone, also failed to differentiate the depressed from the nondepressed group. Correlations between SDS scores and income or educational level were not significant. Thirty different medical complaints and disorders were specified in the data base. These problems included the common chronic diseases of late life, such as hypertension, heart disease, chronic lung disease, stroke, arthritis, and diabetes. Of this large group of health problems, only chronic obstructive lung disease appeared to

be associated with high depression scores, but this association was not statistically significant (p = .09) (Borson et al., 1986).

These findings indicated that significant depressive symptoms were present in about one quarter of older men with chronic disease. The calculated probable prevalence of major depression suggests that approximately 10% of these chronically ill men were experiencing a syndromal depression. Such depressive episodes are likely to be relieved by specific antidepressant pharmacotherapy or by psychotherapy. Some patients reporting significant problems with depression are likely to be experiencing transient affective disturbances which will improve without professional attention. For others, self-reported depressive symptoms reflect another nonaffective disorder, such as side effects of medication prescribed for treatment of medical illness.

Recommendations by the authors included further research to define the extent of depression among elderly medical patients with chronic illness. Such research promises benefits in improved quality of life and may decrease functional impairments from chronic disease such as side effects of medications.

As previously stated, only one study could be found with the specific purpose of identifying drugs that were related to depression. Higginbottom (1986) conducted a

descriptive correlational study designed to identify drugs significantly related to depression. Data were collected from 37 subjects who were over the age of 50, oriented to person, and took at least one drug for medical illness. The sample was obtained from a local medical clinic in a rural northeast county in Mississippi. All subjects were administered the Zung Self-Rating Depression Scale and a Drug Information Sheet. The drugs were categorized and compared with the depression score. The results demonstrated significance between three drug categories and depression (at the .05 level). These were antianginal (r = .3805), antidepressants (r = .3621), and muscle relaxers (r = .2789). Based upon the findings of this study, the following recommendations were made: (a) conduction of a similar study controlling for the presence of a depressive life event and (b) conduction of a longitudinal study to investigate the long-term effects of various drugs and drug regimes.

In summary, the cited studies documented the prevalence of depression of elders living independently in the community. Two of these studies examined the interaction of emotional and physical conditions. In Freedman et al.'s (1982) study, hypertension was the major diagnosis for 57 subjects; arthritis and hypertension were equally dominant for 43 subjects. A fourth of this sample had depression scores indicating moderate to severe depression. In Borson

et al.'s (1986) study, 406 subjects had chronic diseases of late life including hypertension and heart disease. One quarter of these older men had scores indicating significant depression. Therefore, the association has been made between chronic illness and depressive symptomatology. However, little research has examined the medication that chronically ill elders ingest and their level of depression. Borson et al. (1986) suggested that depressive symptoms may reflect another nonaffective disorder such as side effects of medication. Therefore, more research is needed concerning medication ingestion by elders and level of depression.

Chapter III

The Research Design

The type of research employed in this study was descriptive ex post facto to determine the effects of antihypertensive and cardiac drugs and level of depression in community-based elders. The descriptive design has as its main objective "the accurate portrayal of the characteristics of persons, situations, or groups and the frequency with which certain phenomena occur" (Polit & Hungler, 1983, p. 528). In ex post facto study designs the investigator attempts to study something after the fact. Instead of introducing or manipulating an independent variable, the investigator selects subjects who have undergone some life experience. When the independent variable cannot be manipulated and random assignment of subjects to control and experimental groups are not possible, an ex post facto study is appropriate and worthwhile (Wilson, 1989).

Variables

The independent variable in this study was the use of antihypertensive drugs or cardiac drugs, or both antihypertensive and cardiac drugs used by community-based

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elders. The dependent variable in this study was the level of depression in the elderly subjects as determined by the Brink Geriatric Depression Scale. Controlled variables were age and type of drug regime. Intervening variables could have included previous episodes of depression not medically induced, the participant's level of anxiety, and mental and physical states at the time of testing.

Limitations

Three limitations of the study design were identified that prevented generalization. The fact that the subjects are over 55 years of age limits generalization to young adults. Also, the fact that the study was limited to three counties prohibits generalization to other geographic areas. Thirdly, the fact that only antihypertensive and cardiac drugs were studied prohibits generalization to other classes of drugs with the side effect of depression.

Setting, Population, and Sample

The setting of this study was a rural tri-county area of Northeast Mississippi whose residents use one family practice physician's office. This practice includes a large clientele with an average of 80 to 90 clients seen per office day. Client ages range from newborns to 90 years plus with the majority being 55 years and older. Of these elders, the majority are treated for chronic illness, including hypertension, diabetes, and heart disease.

The population consisted of clients 55 and older who were currently using antihypertensive and cardiac drugs and receiving health care at the medical clinic. The research sample for this study was one of convenience and consisted of all elderly clients who were present on the days of data collection and agreed to participate in the study. Subjects were divided into four groups. Group 1 consisted of elders taking neither antihypertensive nor cardiac drugs. Group 2 consisted of elders taking antihypertensive drugs only. Group 3 consisted of elders taking cardiac drugs only. Group 4 consisted of elders taking both antihypertensive and cardiac drugs. Data were collected from participants during the months of April and May 1990. The sample size was 40.

Data Gathering Process

Approval from the Committee on Use of Human Subjects in Experimentation of Mississippi University for Women (see Appendix A) was obtained. The medical clinic physician was contacted, and the purpose and methodology of the study were explained. The agency consent form was signed at this time (see Appendix B). Permission was obtained to use the Brink Geriatric Depression Scale (see Appendix C). The physician's clinic was visited one day prior to testing dates to select potential research participants. The next day the researcher approached clients on an individual basis in the waiting room and explained the purpose of the study.

The participants were assured that all information would be treated as confidential. At this time written consent was obtained from the participants (see Appendix D).

The subjects then were asked to accompany the researcher to a treatment room in the clinic. Each participant was administered the Drug Information Sheet (see Appendix E) and the Brink Geriatric Depression Scale (see Appendix F). The researcher was present to assist each participant individually as needed for recording present medications and to answer any questions regarding the study. After completion, the questionnaires were stapled together and placed in an envelope.

A pilot study was conducted with five research subjects to detect any unforeseen problems with this research process. No changes of the instruments, data collection techniques, or characteristics of the sample were necessary. Therefore, these subjects were included in the total sample.

Instrumentation

Each participant completed the Drug Information Sheet which consists of six demographic and social questions including age, sex, race, marital status, and medical diagnosis. A section also was included to list all prescribed medicines and nonprescribed medicines. This instrument was researcher-designed and has no established reliability or validity. However, since only factual

information was asked, it is considered valid within the confines of this study.

Each participant also completed the Brink Geriatric Depression Scale (GDS). The purpose of the GDS is to measure the level of depression in the elderly population. It is a 30-item assessment scale with yes/no answers designed for geriatric clients and based almost exclusively on psychologic discriminators. Directions for administration and scoring are clear and complete. The participant simply reads and circles the answer. Of the 30 questions, 20 indicate the presence of depression when answered positively (2, 3, 4, 6, 8, 10, 11, 12, 13, 14, 16, 17, 18, 20, 22, 23, 24, 25, 26, 28) while the other 10 (1, 5, 7, 9, 15, 19, 21, 27, 29, 30) indicate depression when answered negatively. Answers were scored as follows: 0 to 10 = normal, 11 to 20 = mild depression, 21 to 30 = severe depression. This scale is markedly effective in determining the presence of significant depression as the confounding features (physical complaints, libido, and appetite) are deemphasized. The length, level of difficulty, and amount of time needed to complete the instrument were acceptable for the intended subjects (Brink & Yesavage, 1983; Dreyfuss, 1988; Ebersole & Hess, 1985).

The GDS was tested for reliability and validity and compared with the Hamilton Rating Scale for Depression

(HRS-D) and the Zung Self-Rating Depression Scale (SDS).
Two groups of geriatric subjects were chosen for the
validation phase of the GDS. The first group (n = 40)
consisted of elderly persons with no history of mental
illness. The second group (n = 60) consisted of elderly
persons under treatment for depression. The subjects were
given a clinical interview which involved a rating of the
HRS-D and administration of the GDS and the SDS. Four
measures of internal consistency were computed for each of
the three depression scales. The mean correlation between
the items of the GDS was .56, suggesting that all of the
items on this scale do, in fact, measure a common latent
variable. The mean intercorrelation among items from the
GDS was .36; the computed values for the SDS and HRS-D were
.25 and .34, respectively. These values are in a range
necessary for a high degree of internal consistency for each
scale as a whole. Cronbach's alpha coefficient was utilized
in order to provide an overall measure of the internal
consistency of the GDS. The computed value of the alpha
coefficient was .94, suggesting a high degree of internal
consistency for the GDS. Using the split-half reliability
method, the reliability coefficients for the GDS, SDS, and
HRS-D were found to be .94, 81, and .82, respectively (Brink
& Yesavage, 1983).

The primary test of the validity of the GDS as a
measure of depression was provided by the classification of

subjects as normal, mildly depressed, or severely depressed. An analysis of variance was conducted in which the classification variable served as a between-subjects factor while the subjects' total scores on the GDS served as the dependent measure. Similar analyses provided evidence for each of the scale's validity. In each analysis the main effect for the classification variable was highly significant. Respective F scores were 99.48 for the GDS, 44.75 for the SDS, and 110.63 for the HRS-D. These findings then provide evidence for the validity of the GDS as a measure of depression as well as validating the SDS and HRS-D (Brink & Yesavage, 1983).

Data Analysis

Data for the null hypothesis were analyzed using the analysis of variance (ANOVA). This statistical method was appropriate because four groups were compared. Data for hypotheses 2, 3, 4, 5, and 6 were analyzed using the t test. The t test was an appropriate statistical test with these data because two groups were compared.

Chapter IV

Results of the Study

The purpose of this study was to determine the effects of anti-hypertensive and cardiac drugs and level of depression in community-based elders. The type of research employed in this study was descriptive ex post facto. The subjects were divided into four groups according to their drug usage, and data were analyzed using the one-way analysis of variance (ANOVA) and the directional t test. The findings of this study are presented in this chapter.

Sample

The total sample was divided into four groups. The groups were divided as follows: (a) Group 1, elders taking neither antihypertensive or cardiac drugs; (b) Group 2, elders taking antihypertensive drugs only; (c) Group 3, elders taking cardiac drugs alone; and (d) Group 4, elders taking both antihypertensive and cardiac drugs. The characteristics of these groups can be found in Appendix G.

The sample was comprised of 40 subjects ranging in age from 55 to 88 years with a mean age of 70. There were 20 (50%) married, 13 (33%) widowed, and 7 (17%) single

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subjects. Sixteen (40%) of the sample were male and 24 (60%) were female. Thirty (75%) of the sample were white, and 10 (25%) were black.

The subjects' scores on the Brink Geriatric Depression Scale ranged from 1 to 16 with an average of 10.4. There were 15 (37%) subjects who scored normal, and 25 (63%) subjects who scored mildly depressed.

Group 1. Group 1 was the control group and consisted of 10 elders taking neither antihypertensive nor cardiac drugs. The age range was 55 to 72 years with a mean age of 62. Five (50%) of these subjects were male and 5 (50%) were female. There were 6 (60%) married and 4 (40%) widowed. Eight (80%) of these subjects were white, and 2 (20%) were black. The subjects' scores on the Brink Geriatric Depression Scale ranged from 1 to 14 with an average score of 7.3. There were 7 (70%) subjects who scored normal and 3 (30%) who scored mildly depressed.

Group 2. Group 2 consisted of elders taking antihypertensive drugs only. The age range was 55 to 79 years with a mean age of 68. Four (40%) of these subjects were male and 6 (60%) were female. There were 8 (80%) married and 2 (20%) widowed subjects. Seven (70%) of these subjects were white and 3 (30%) were black. The subjects' scores on the Brink Geriatric Depression Scale ranged from 6 to 14 with an average of 10.1. There were 3 (30%) subjects who scored normal and 7 (70%) who scored mildly depressed.

Group 3. Group 3 consisted of elders taking cardiac drugs only. The age range was 60 to 88 years with a mean age of 78. Four (40%) of these subjects were male and 6 (60%) were female. There were 4 (40%) widowed, 5 (50%) single, and 1 (10%) married subjects. Seven (70%) of these subjects were white and 3 (30%) were black. The subjects' scores on the Brink Geriatric Depression Scale ranged from 9 to 16 with an average of 12.1. There were 3 (30%) subjects who scored normal and 7 (70%) who scored mildly depressed.

Group 4. Group 4 consisted of elders taking both antihypertensive and cardiac drugs. The age range was 60 to 80 years with a mean age of 72. Three (30%) of these subjects were male, and 7 (70%) of these subjects were female. There were 2 (20%) single, 5 (50%) married, and 3 (30%) widowed subjects. Eight (80%) of these subjects were white and 2 (20%) were black. The subjects' scores on the Brink Geriatric Depression Scale ranged from 9 to 14 with an average of 12.1. There were 2 (20%) subjects who scored normal and 8 (80%) who scored mildly depressed.

Data Analysis

Hypothesis 1. The first hypothesis was that there would be no difference in mean depression scores among the following: Group 1, elders taking neither antihypertensive or cardiac drugs; Group 2, elders taking antihypertensive only; Group 3, elders taking cardiac drugs alone; and Group 4, elders taking a combination of antihypertensive and

cardiac drugs. The mean scores for these subjects were:
Group 1, 7.3; Group 2, 10.1; Group 3, 12.1; and Group 4,
12.1. Scores were analyzed using the one-way analysis of
variance (ANOVA). Since $F(3, 40) = 5.036$, $p = .037$, the
null hypothesis was rejected. These data can be found in
Table 1.

Table 1

Comparison of Community-Based Elders Among Groups Using the
ANOVA

Source	df	SS	MS	F
Between groups	3	154.8000	51.6000	5.036*
Within groups	36	368.8000	10.2444	
Total	39	523.6000		

*$p = > .05$.

Hypothesis 2. The second hypothesis was that
community-based elders taking antihypertensive drugs would
experience a significantly higher level of depression than
elders not taking both antihypertensive and cardiac drugs.
The mean scores for these subjects were: Group 2, 10.1 and
Group 1, 7.3. Scores were analyzed using the directional t
test. Since $t(20) = 1.956$, $p = .03$, the second hypothesis
was accepted. These data can be found in Table 2.

Table 2

Comparison of Community-Based Elders Taking Antihypertensive

Drugs and the Elder Control Group Using the t Test

	n	M	SD	t
Group 2	10	10.1	2.96	
Group 1	10	7.3	4.79	1.956*

*p = > .05.

Hypothesis 3. The third hypothesis was that elders
taking cardiac drugs would experience a significantly higher
level of depression than elders not taking both
antihypertensive and cardiac drugs. The mean scores for
these subjects were: Group 3, 12.1 and Group 1, 7.3.
Scores also were analyzed using the directional t test.
Since t(20) = 3.353, p = .001, the third hypothesis was
accepted. These data can be found in Table 3.

Table 3

Comparison of Community-Based Elders Taking Cardiac Drugs

and the Elder Control Group Using the t Test

	n	M	SD	t
Group 3	10	12.1	.72	
Group 1	10	7.3	4.79	3.353*

*p = > .05.

Hypothesis 4. The fourth hypothesis was that elders taking both antihypertensive and cardiac drugs would experience a significantly higher level of depression than elders taking antihypertensive drugs alone. The mean scores for these subjects were: Group 4, 12.10 and Group 2, 10.10. Scores were analyzed using the directional t test. Since t(20) = 1.397, p = .086, the fourth hypothesis was rejected. These data can be found in Table 4.

Table 4

Comparison of Community-Based Elders Taking Antihypertensive and Cardiac Drugs and Elders Taking Antihypertensive Drugs Alone Using the t Test

	n	M	SD	t
Group 4	10	12.10	2.02	1.397
Group 2	10	10.10	2.96	

Hypothesis 5. The fifth hypothesis was that elders taking both antihypertensive and cardiac drugs would experience a significantly higher level of depression than elders taking cardiac drugs alone. The mean scores for these subjects were: Group 4, 12.10 and Group 3, 12.10. Scores were analyzed using the directional t test. Since

$\underline{t}(20)$ = .000, $\underline{p}$ = .50, the fifth hypothesis was rejected. These data can be found in Table 5.

Table 5

Comparison of Community-Based Elders Taking Antihypertensive and Cardiac Drugs and Elders Taking Cardiac Drugs Alone Using the t Test

	$\underline{n}$	$\underline{M}$	$\underline{SD}$	$\underline{t}$
Group 4	10	12.10	2.02	.000
Group 3	10	12.10	2.28	

Hypothesis 6. Finally, the sixth hypothesis was that elders taking both antihypertensive and cardiac drugs would experience a significantly higher level of depression than elders taking neither antihypertensive nor cardiac drugs. The mean scores for these subjects were: Group 4, 12.10 and Group 1, 7.3. Scores were analyzed using the directional $\underline{t}$ test. Since $\underline{t}(20)$ = 3.353, $\underline{p}$ = .001, the sixth hypothesis was accepted. These data can be found in Table 6.

Table 6

Comparison of Community-Based Elders Taking Antihypertensive

and Cardiac Drugs and Elders Taking Neither Antihypertensive

Nor Cardiac Drugs Using the t Test

	n	M	SD	t
Group 4	10	12.10	2.02	3.353*
Group 1	10	7.30	4.79	

*p = > .05.

Chapter V

Outcomes

Summary

The purpose of this descriptive ex post facto study was to determine the effects of antihypertensive and cardiac drugs on the level of depression in community-based elders. Roy's Adaptation Model provided the theoretical framework for this study. Data were collected using the Brink Geriatric Depression Scale and the Drug Information Sheet. These questionnaires were administered to 40 subjects ages 55 and older who were taking antihypertensive and/or cardiac drugs or neither antihypertensive nor cardiac drugs.

The null hypothesis guiding this study contended that there would be no difference in mean depression scores among the following groups: (a) community-based elders taking neither antihypertensive nor cardiac drugs, (b) community-based elders taking antihypertensive drugs alone, (c) community-based elders taking cardiac drugs alone, and (d) community-based elders taking a combination of antihypertensive and cardiac drugs. Data were analyzed using the ANOVA. Since the result was significant at the .05 level, the researcher rejected the null hypothesis.

The researcher further hypothesized the following:

Ha_1: Community-based elders taking antihypertensive drugs would experience a significantly higher level of depression than community-based elders taking neither antihypertensive nor cardiac drugs.

Ha_2: Community-based elders taking cardiac drugs would experience a significantly higher level of depression than community-based elders not taking antihypertensive and cardiac drugs.

Ha_3: Community-based elders taking antihypertensive and cardiac drugs would experience a significantly higher level of depression than community-based elders taking antihypertensive drugs alone.

Ha_4: Community-based elders taking antihypertensive and cardiac drugs would experience a significantly higher level of depression than community-based elders taking cardiac drugs alone.

Ha_5: Community-based elders taking antihypertensive and cardiac drugs would experience a significantly higher level of depression than community-based elders taking neither antihypertensive nor cardiac drugs.

Data were analyzed using the directional (one-tailed) t test. Since Hypotheses 2, 3, and 6 were significant at the .05 level, the researcher accepted these hypotheses. Hypotheses 4 and 5 were not significant; therefore, the researcher rejected these hypotheses.

Discussion, Conclusions, and Implications

The findings from this study indicated the elders who took antihypertensive and/or cardiac drugs experienced a significantly higher level of depression as compared to elders who did not take antihypertensive nor cardiac drugs. These results support Higginbottom's (1986) finding that depression and use of antianginal agents were correlated. These current findings suggest that cardiac drugs alone appear to have significant effects on the elder's level of depression. However, reasons for depression other than medication should be considered. The presence of a chronic illness or the seriousness of a cardiac disease could be considered a cause of the elder's depression. In addition, the average age of the subjects taking only cardiac drugs was 77.6 years as compared to 62 years in the control group. Perhaps, as a result of their developmental stage the older participants were undergoing adjustment to losses not encountered by the younger sample. This age finding does not support Freedman et al.'s (1982) study where women showed peak depression symptoms in the 65-69 year range and men in the subsequent 70-74 year range. These suggestions and findings support the need for more research examining other chronic illnesses and level of depression and age groups and level of depression.

Utilizing this information and Roy's Adaptation Model, the Geriatric Nurse Clinician (GNC) should carefully assess

for signs and symptoms of depression in all elders taking cardiac drugs. These elders should be considered to be at a higher risk for depressive symptomatology. Depression caused by pharmacotherapeutic agents signifies adaptation failure. The goal of the GNC is to identify maladaptive responses and their causes and to help bring about adaptation resulting in a better quality of life for the elder.

Antihypertensive drugs alone were found to have an effect on level of depression; however, a combination of antihypertensive and cardiac drugs appear to have a more significant effect on level of depression. No research was found which either supported or refuted this finding. Again, this level of depression may be the result of having a combination of chronic illnesses or ingestion of multiple medications. Therefore, the need for research examining chronic illnesses and level of depression in elders is mandated. Freedman et al. (1982) and Borson et al. (1986) examined elders with chronic illnesses (arthritis, hypertension, and heart disease) and depressive symptomatology. These current findings support the association that has already been established between chronic illnesses and depressive symptoms. However, these findings of mild depression refute Freedman et al. (1982) and Borson et al.'s (1986) findings of moderate to severe depression in community-based elders. Since these findings

utilized only 40 subjects from a small rural area, further research in another geographic area and with a larger sample are needed to determine generalizability of the findings.

According to Riehl and Roy (1980), focal stimuli are stimuli immediately confronting the person. In this research pharmacotherapeutic agents are focal stimuli. Therefore, the GNC should maintain a knowledge of the drugs with the known side effect of depression. The GNC can prescribe medication in collaboration with a physician, so discretion should be used in prescribing multiple drugs and in prescribing and monitoring those drugs and level of depression. Education of other health care providers also is needed concerning drug categories with the known side effect of depression in order to minimize the risk of pharmacotherapeutic depression.

Since depression affects the elder's functioning in all adaptive modes and predisposes the elder to suicide, the GNC should consult with the physician whenever possible to adjust the medication regimen so that the risk of pharmacotherapeutic depression can be minimized. In the event these medications cannot be avoided, the elder should be counseled concerning side effects of medications and signs and symptoms of depression.

Overall, elders in this study had scores indicating mild depression. Yet, each elder group under investigation contained subjects who were not depressed, and the control

group contained elders who were mildly depressed. In the control group (elders taking neither antihypertensive nor cardiac drugs), 3 (30%) of the subjects scored mildly depressed. In Groups 2 and 3 (elders taking antihypertensive or cardiac drugs), 3 (30%) had normal depression scores. In Group 4 (elders taking antihypertensive and cardiac drugs), 2 (20%) of the subjects had normal depression scores. Therefore, not every elder taking these medications experienced depression, and those elders who took neither medication still experienced depression. It is important to note that depression scores exhibited were only at the mild rather than moderate or severe depression level.

Based on the conclusions of this study, pharmacotherapeutic depression may or may not result when antihypertensive and/or cardiac drugs are ingested. In the event that pharmacotherapeutic depression results, the GNC should initiate measures in each of the adaptive modes for helping the elder cope with depression and hopefully bring about a more adaptive response. Along with establishing a therapeutic nurse-client relationship, antidepressant medications may be in order. Other interventions to assist the elder in coping with depression include relaxation or meditation techniques, exercise, new interests, and diversional activities. These actions may then lead to a decrease in health problems caused by depression and a better quality of life for elders.

<u>Recommendations</u>

Based upon the findings of this study, the following recommendations are made:

<u>Research</u>

1. Conduction of a similar study including other chronic illnesses and level of depression.

2. Conduction of a similar study using age cohort groups and level of depression.

3. Conduction of a similar study to determine effects of multiple medication ingestion and level of depression.

4. Replication of this study in another geographic area using a larger sample size to determine generalizability of findings.

<u>Nursing</u>

1. Maintenance of an awareness for the drug categories with the known side effect of depression.

2. Discretion in prescribing and monitoring those drug categories with the known side effect of depression.

3. Assessment of those elders who are taking antihypertensive and/or cardiac drugs for depressive symptomatology.

4. Education of other health care providers concerning drug categories with the side effect of depression.

5. Education of the client concerning side effects of medications and signs and symptoms of depression.

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Appendix A

Approval of Committee on Use of Human Subjects in Experimentation

MISSISSIPPI UNIVERSITY FOR WOMEN

Columbus, MS 39701

Vice President for Academic Affairs
P.O. Box W-1603
(601) 329-7142

March 21, 1990

Ms. Angela A. Hays
Division of Nursing
Campus

Dear Ms. Hays:

The Committee on Use of Human Subjects in Experimentation has recommended approval of your proposal "Relationship Between Side Effects of Antihypertensive and Cardiac Drugs and Level of Depression in Community-Bassed Elders." I am happy to approve their recommendation.

Sincerely,

Dorothy Burdeshaw
Interim Vice President
for Academic Affairs

DB:ci

cc: Mrs. Mary Pat Curtis

Where Excellence is a Tradition

Appendix B

Consent to Conduct Study

Research Study:

Effects of Antihypertensive and Cardiac Drugs and Level of Depression in Community-Based Elders

My name is Angela Hays. I am a registered nurse and graduate student at Mississippi University for Women. I am studying medicines that may be related to depression in older people. The results of this study will be used by health care providers to improve care for older people. Health care providers will be able to prescribe a different regimen of drugs that are not related to depression, thereby helping older people lead a more meaningful life. A copy of the results of the study will be available at your request.

I would like written permission to use your clinic for my study. Assistance from your staff in data collection will not be required, and your office routine will not be affected. Thank you for your time and assistance.

I hereby give permission for my patients to participate in this study.

Date: _____   Signed:_____

Date: _____   Researcher:_____

Permission to Use Tool

27 Nov 89

Angela Hays, R.N.
P.O. Box 393
Walthall, MS   39771

Dear Ms. Hayes:

Enclosed is a copy of the scale you requested, complete with scoring/administration instructions, and even an annotated bibliography. (Sorry, I do not have more reprints of the articles listed in the bibliography.) I hereby grant permission to use in your clinical work and research, but strongly suggest that you do not alter the guidelines for administration and scoring (nor delete items). If you will be trying to show a treatment effect, I suggest that you start out with a clinically depressed sample. If your sample size is small, I suggest the use of non-parametric statistics (e.g., Fisher Exact, Mann-Whitney, Sign Test, Friedman, Kolmogorov-Smirnov).

Let me take this opportunity to tell you a little about the journal that I edit. Clinical Gerontologist, now in its seventh year, is for psychiatrists, psychologists, social workers, geriatricians, nurses, and other counselors. Our editorial board includes Manfred Bergener, Dolores Gallagher, V.A. Kral, Myrna Lewis, Nancy Miller, Brice Pitt, Peter Rabins, Sir Martin Roth, Jerome Yesavage, and other clinical gerontologists around the world. CG covers topics such as dementia, depression, hypochondriasis, paranoia, assessment, psychotherapy, psychopharmacology, family counseling, and multi-disciplinary teams. What distinguishes CG from some other journals in this field is an uncompromising commitment to practitioner relevance. If you are not yet a subscriber to CG, just contact the Haworth Press at 10 Alice Street, Binghamton, NY 13904-1580.

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How to contact me: FIRST CLASS MAIL TO MY ABOVE ADDRESS. If you write me in Mexico, Stanford, or Haworth, I may get your letter next month. If you send express mail or certified, they don't leave it in my box, and I'll get in the next time I get down to the post office. If you call me, we trade telephone messages for weeks without speaking directly to each other. So, just send me a first class letter, please.

T.L. Brink

Appendix D

Informed Consent Form

My name is Angela Hays. I am a registered nurse and graduate student at Mississippi University for Women. I am studying about medicines that may be related to your feelings. Although there will be no direct benefits to you, the results of this study will be used by health care providers to improve care for older people. If you should decide to help in this study, you will be asked to complete two questionnaires. One questionnaire asks for information about you and your medicines. The other questionnaire will help to determine your mood at this time. The two questionnaires will take about 20 minutes or less to complete. No names will be used, and this information will be destroyed after it is analyzed. If you should decide not to help, your health care at this clinic will not be affected in any way.

Thank you for your time and assistance.

Date:_____ Name:_____

Date:_____ Researcher:_____

Appendix E

Code_____

Drug Information Sheet

Age:_____   Medical Diagnosis:_____

Sex: Male_____   Female_____

Race:
_____ White
_____ Black
_____ Hispanic
_____ Oriental
_____ Other

Marital Status: (Please check correct one)
_____ Single
_____ Married
_____ Widowed
_____ Separated
_____ Divorced

List medicines that you are taking now that are ordered by your doctor:

_____   _____   _____

_____   _____   _____

_____   _____   _____

List any other medicines that you are taking now not ordered by your doctor that you buy at the drug store, grocery store, or convenience store.

_____   _____   _____

_____   _____   _____

_____   _____   _____

Appendix F

Brink Geriatric Depression Scale

Choose the best answer for how you have felt over the past week.

1. Are you basically satisfied with your life?
Yes_____ No_____

2. Have you dropped many of your activities and interests?
Yes_____ No_____

3. Do you feel that your life is empty? Yes_____ No_____

4. Do you often get bored? Yes_____ No_____

5. Are you hopeful about the future? Yes_____ No_____

6. Are you bothered by thoughts you can't get out of your head? Yes_____ No_____

7. Are you in good spirits most of the time?
Yes_____ No_____

8. Are you afraid that something bad is going to happen to you? Yes_____ No_____

9. Do you feel happy most of the time? Yes_____ No_____

10. Do you often feel helpless? Yes_____ No_____

11. Do you often get restless and fidgety? Yes_____ No_____

12. Do you prefer to stay at home, rather than going out and doing new things? Yes_____ No_____

13. Do you frequently worry about the future?
Yes_____ No_____

14. Do you feel you have more problems with memory than most? Yes_____ No_____

15. Do you think it is wonderful to be alive now?
Yes_____ No_____

16. Do you often feel downhearted and blue? Yes____ No____

17. Do you feel pretty worthless the way you are now?
    Yes____ No____

18. Do you worry a lot about the past? Yes____ No____

19. Do you find life very exciting? Yes____ No____

20. Is it hard for you to get started on new projects?
    Yes____ No____

21. Do you feel full of energy? Yes____ No____

22. Do you feel that your situation is hopeless?
    Yes____ No____

23. Do you think that most people are better
    off than you are? Yes____ No____

24. Do you frequently get upset over little things?
    Yes____ No____

25. Do you frequently feel like crying? Yes____ No____

26. Do you have trouble concentrating? Yes____ No____

27. Do you enjoy getting up in the morning?
    Yes____ No____

28. Do you prefer to avoid social gatherings?
    Yes____ No____

29. Is it easy for you to make decisions? Yes____ No____

30. Is your mind as clear as it used to be? Yes____ No____

Appendix G

Characteristics of the Research Sample by Groups

Subject	Age	Sex[a]	Race[b]	Marital Status[c]	Group[d]	Depression Score[e]	Depression Group[f]
				Group 1			
1	55	1	0	2	1	6	1
2	60	0	0	2	1	11	2
3	60	0	0	2	1	11	2
4	60	0	0	2	1	1	1
5	55	1	0	2	1	11	2
6	56	0	0	2	1	1	1
7	58	0	1	3	1	9	1
8	72	1	1	3	1	1	1
9	67	0	0	3	1	9	1
10	72	1	0	3	1	10	1
				Group 2			
11	79	1	0	3	2	6	1
12	72	1	0	3	2	12	2
13	55	1	0	2	2	6	1
14	67	1	0	2	2	12	2
15	72	1	1	2	2	14	2

[a]Sex: 0 = Male, 1 = Female. [b]Race: 0 = White, 1 = Black. [c]Marital Status: 1 = Single, 2 = Married, 3 = Widowed. [d]Group: 1 = Control, 2 = Antihypertensive, 3 = Cardiac, 4 = Antihypertensive and Cardiac. [e]Depression Score. [f]Depression Group: 1 = Normal, 2 = Mildly Depressed.

Subject	Age	Sex	Race	Marital Status	Group	Depression Score	Depression Group
16	72	0	1	2	2	11	2
17	60	0	0	2	2	6	1
18	65	1	0	2	2	11	2
19	68	0	0	2	2	12	2
20	69	0	1	2	2	11	2

Group 3

Subject	Age	Sex	Race	Marital Status	Group	Depression Score	Depression Group
21	80	1	0	3	3	11	2
22	86	1	0	1	3	14	2
23	88	1	0	3	3	9	1
24	85	1	0	3	3	10	1
25	87	0	1	3	3	11	2
26	65	0	1	1	3	14	2
27	80	1	0	1	3	10	1
28	65	0	0	1	3	14	2
29	60	0	1	2	3	16	2
30	80	1	0	1	3	12	2

Group 4

Subject	Age	Sex	Race	Marital Status	Group	Depression Score	Depression Group
31	60	0	0	2	4	12	2
32	67	1	0	2	4	13	2
33	72	1	0	1	4	14	2
34	65	1	0	2	4	14	2
35	80	0	0	2	4	9	1
36	75	1	0	1	4	11	2
37	72	0	1	2	4	14	2
38	80	1	1	3	4	9	1
39	72	1	0	3	4	14	2
40	80	1	0	3	4	11	2