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Satisfaction and Quality of Housing among Older Persons in Rural East Trinidad

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Abstract

Currently the proportion of older persons in rural areas is rising. Many of those based in rural areas are older persons with a strong agricultural background and indeed many are aging farmers. This study determined for low-income older persons in rural Trinidad and Tobago their satisfaction with their housing, their housing quality status and the factors influencing their housing quality status. 300 old aged pensioners (65 and 103 years old) were personally interviewed. While the majority (67.7 %) of older persons was satisfied with their housing, 46 % had poor quality housing. Older persons considered themselves to be in poorer health than the general US population, but in about the same state of mental health. The main predictors of housing quality status were whether the respondent lived alone, the levels of education, income and the gender of the elderly respondent.

Keywords: Older Persons, Housing Quality and Satisfaction, Housing Quality Index, Trinidad

Introduction

Currently the proportion of older persons in rural areas is rising. Many of those based in rural areas are older persons with a strong agricultural background and indeed many are aging farmers. Most are facing various levels of food insecurity and worsening socioeconomic indices. The increasing longevity experienced throughout the world has generated interest in the housing status of older persons and their satisfaction with their housing. In the Caribbean, Trinidad and Tobago ranks number 62 of all the nations (187) profiled in the Human Development Index (HDI) and thus falls within the High Human Development category (UNDP, 2011). As the number and percentage of older persons in Trinidad and Tobago continue to increase, little is known about their satisfaction with their housing, and the social and economic factors that affect their housing status.

The Trinidad and Tobago Government's vision for housing as outlined in the Housing Sub-committee Report is to provide adequate housing for all citizens by 2020, and item 1 in its Credo indicates that every citizen has a right to access adequate housing (Vision 2020 Housing Sub-Committee Report, 2003). However, there is no specific reference to older persons in this credo. Although governmental policies for housing target low income families, there is no housing policy for older persons, other than the allocation to them of apartments located on the ground floor of housing duplexes and apartment blocks. In addition, there is no evidence that the housing services for older persons have increased appropriately. This paper focuses on the issues of their

housing conditions and looks specifically at those factors affecting the level of housing quality and satisfaction. As a result, this study sought to discover important information for a rural low-income older population of Trinidad and Tobago and to suggest policy interventions to improve the housing of this vulnerable segment of the Society. The objective of the study was met through four sub-objectives:

- To determine the satisfaction of the low-income rural older persons with their housing;
- To measure the socio-economic and personal characteristics of low income rural older persons;
- To assess the housing quality status by a housing quality score and to discover the relationship between this housing quality score and the satisfaction of low-income rural older persons with their housing; and
- To discover the factors which determine the housing quality score of low income, rural older persons.

Analytical Framework

- **Housing Quality Status**

Housing quality status refers to the actual housing condition of an individual, as measured by the essential features of actual living conditions. The type of physical structure in which people are housed, the space available and the degree of overcrowding, facilities available for use and location are indicative of the quality of life, and the level of well-being of household members (CSO, 1990). Shelter is one of the basic necessities in life, but when households purchase or rent a house, they are also concerned with other factors or services associated with the house. These factors include security, privacy, their neighborhood, status, community facilities and services, access to jobs and control over their environment. If a household is deprived of these other factors, they may not be able to enjoy the comfort of a house.

Adequate housing is an important issue for all age groups. It is particularly important, however, for the older persons, because their housing needs change: not only do children leave, family members migrate and spouses die, but also economic circumstances often change, largely because of declining employment opportunities, and poverty. As people age, their health changes significantly (high prevalence of chronic illnesses, risk of falls etc.), often dramatically, affecting the suitability of their existing housing arrangements and their future needs. At present, there are approximately 132,022 citizens in Trinidad and Tobago over the age of 60 (CSO, 2011). The increase in the population of older persons has given rise to the spiraling growth in homes for older persons. This has caused Government to take a closer look at these geriatric homes. According to the United Nations (1991) appropriate housing conditions are very important for older persons, since most of their activities are in the home. The Committee on an Aging Society (1988) defined “physically inadequate housing”, as units having any one of the types of deficiencies listed in APPENDIX-Table 1, developed by the United States Department of Housing and Urban Development (HUD). A subset of physically inadequate units are judged to be “seriously inadequate”, if they have any one of the following deficiencies: 1, 2, 9 and 10; or five of the six structural problems listed in deficiency 5; or all four of the “common areas” problems.

A Housing Quality Index (HQI) is a measurement tool used to assess and evaluate the quality of housing. Ghana represents a case in the developing world where such an index was

devised. Here a collection of thirteen items were used for the HQI as follows: the materials of the outer walls and roofs; cooking and lighting fuel; water and sewage services; tenure; and distances to the nearest drinking water, food market, public transportation, primary and secondary schools and health services (Fiadzo, 2004). In the case of the Caribbean, Potter (1992) selected eight individual housing variables taken from the 1980/81 Population Census of the Commonwealth Caribbean, that were broadly diagnostic of housing conditions in Barbados, to construct a HQI. A description of the items included in this HQI is given in APPENDIX-Table 2.

- **Hypothesized Factors Influencing Housing Quality - Previous Studies**

To meet a major objective of this study, several personal and socio-economic factors were hypothesized as possible determinants of the housing quality status of older persons households. This section discusses from the literature, studies which have suggested explanatory variables for housing quality. This study will then attempt to determine which of these factors are relevant to low-income rural older persons in Trinidad and Tobago.

- *Age of Household Head*

  According to Fiadzo (2004), the housing quality status is significantly and positively affected by the age of the household head. This study found that households that were headed by older individuals tended to have higher scores than those households headed by younger individuals. In Trinidad, however findings from PAHO (1989) suggested an inverse relationship between housing quality and age. The two oldest age groups (75-79 and 80 and over) had consistently lower housing quality than the younger age groups.

- *Gender*

  Fiadzo (2004) found that households headed by females had higher housing quality counterparts. In a review of housing stratification in the United States, Conley (2001) reported that, when the income measure was held constant, the proportion of years of female headship and housing conditions were not significantly related. According to PAHO (1989), in Trinidad, slightly more men under 80 years of age than older men owned their homes, and the percentages of women owning their homes were usually 10 % lower than those of their male cohorts in each age group. In addition, fewer men than women across all age groups reported renting the houses that they lived in (PAHO, 1989).

- *Marital Status*

  In the case of Ghana (Fiadzo, 2004), marital status had a significantly negative relationship to the level of housing quality. Married households shifted the HQI scores lower than unmarried households. In addition, household heads who were married had lower HQI scores than single household heads.

- *Education*

  Fiadzo (2004) reported that achievement in education influenced the HQI considerably; the HQI score was increased with each additional year of education. Conley (2001) reported that households that were headed by more educated individuals were more likely to own a home in the 5 year period 1968 to 1972.

- *Employment*

  There was a significant positive relationship between employment and housing quality in the Barbados case (Potter, 1992). Full-time employment of household heads in

agriculture/forestry/fishing in Ghana significantly and negatively shifted the HQI score lower compared to those household heads employed in the formal sector (Fiadzo, 2004). Also, in Ghana, household heads employed in the private informal sector (including street and market vendors and artisans) experienced HQI scores marginally lower than those of household heads employed in the formal sector (Fiadzo, 2004).

- *Income*

  According to the Fiadzo (2004), in Ghana, the HQI was positively and significantly related to income, with the most important indicator of housing quality in urban areas being the income quintile. In addition higher income reduced the odds of living in overcrowding housing. Clark, Deurloo and Dieleman (1984) reported that in Toronto, Canada, while both expensive and inexpensive rental units were occupied by high income households; a relationship exists between household income and tenure (individuals with lower incomes are more likely to rent than individuals with higher incomes). Chevan (1982) reported that growth in income contributed to housing improvements, in that higher incomes raised many families to the point at which they could afford to purchase a home. He further noted that, the availability of inexpensive mortgage credit also contributed to the growth of home ownership. Heller (1989) reported that low-income Americans are predominantly renters. Of the poor Americans, almost 6 million households pay more than 50 % of their income in rent. Similarly, the National Low Income Housing Coalition (2001) reported that persons who possessed their own houses were wealthier and occupied better housing facilities than renters. Low income also contributed to severe housing problems and 87 % of all renter households that are low income households experience severe housing problems. Most of these renters have incomes below 50 % of the area median income (AMI).

- *Hypothesized Factors Influencing Housing Quality-This Study*

This section discusses new factors which are hypothesized to affect low income rural older persons in Trinidad and Tobago.

- *Physical and Mental Health Status*

  Older persons experience many physical and mental health problems, thus the physical and social welfare of older persons have become challenging issues. The expected outcome of good health reaches far beyond longevity, to the goal of an acceptable quality of life, without disabilities (Moseley, 2001). Older persons, who self-assess their health to be poor, will probably seek medical help more than those who believe they are in excellent health. Health problems such as arthritis, poor vision, hypertension, diabetes mellitus and heart disease were found to be among the most important concerns of older persons, 65 years and older in Trinidad (PAHO, 1989). These disabilities and concerns could affect the housing quality of older persons.

  According to the Mental Health Canada (MHC), (2011) both industrialized and developing countries have experienced an increase in the problem of mental illness among older persons, 65 years and over. The MHC estimates, that in the United States of America, between 15-25 % of older persons suffer from depression, dementias (Alzheimer) and pseudo dementias- common symptoms of mental illness. Globally, older persons top the WHO's list of new cases of mental illness; 236 per 100,000 elderly people suffer from mental illness in comparison to 93 per 100,000 of

people aged 45-64. Even though depression in older people can be treated, many cases go undetected. Research has indicated that depression is a major cause of suicide among older persons in the United States of America (Markson, 2003). In general, therefore it could be expected that the better the physical and mental health of the elderly individual, the higher the individual's HQI score.

An inverse relationship also probably exists between housing quality as a determinant of health status. As reported by Krieger and Higgins (2002), having poor housing facilities contributes to a wide range of health problems, such as respiratory infections, asthma, lead poisoning, injuries and mental health.

- *Level of Aspiration*
  As cited by Pemberton (1985), level of aspiration is a generalized measure of the strength of human motives with respect to goal achievement and the expectancy of success. In other words, it measures the motives the individual sets and the reactions to one's performance and evaluations of that performance by others.

  This measure has been used widely in the study of the impact of motivation on managerial and social processes. Individuals with a higher level of aspiration could be expected to be more motivated to improve their living conditions including the condition of their housing. Therefore, the relationship between the level of aspiration of the individual and housing quality status is expected to be positive.

- **Relationship Between Housing Satisfaction and Housing Quality**

The level of housing satisfaction expressed by persons can be linked to their needs. Wilson and Aspinall (1995) note that as persons get older they become more critical of their home and often express decreasing levels of tolerance for imperfect housing conditions due to changes in physical and social needs. As such, housing satisfaction among older persons should be related to but not limited to the design and layout of amenities, house type, tenure (renting/home owning), and housing conditions, components of the housing quality status of older persons. The relationship between housing satisfaction and housing quality is explored in this study.

Conceptual Model and Study Hypotheses

Arising from the discussions in the previous section, Figure 1 illustrates the factors hypothesized to influence housing quality status of older persons and the relationship between housing quality status (measured by the HQI) and housing satisfaction.

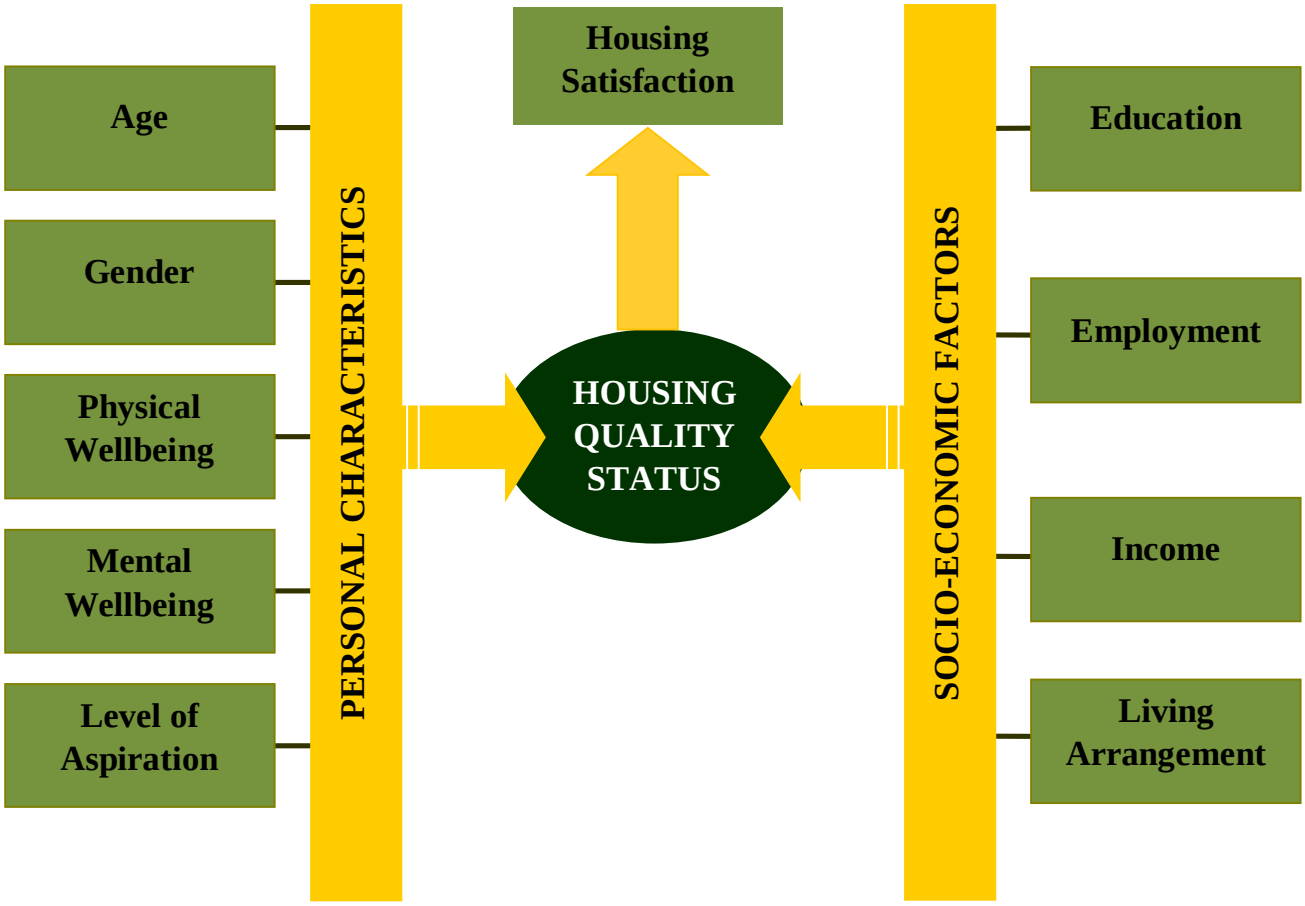

Figure 1: Hypothesized Factors Influencing Housing Quality Status

This study hypothesizes that personal characteristics - age, gender, physical and mental well-being and the level of aspiration as well as socioeconomic factors – education, whether the individual is employed, income and living arrangement determine the HQI score of low income rural older persons in Trinidad. The figure also indicates a hypothesized relationship between housing satisfaction and the HQI score.

Methodology

- **The Survey**

The population examined in this study consisted of low-income older persons, (65 to 103 years of age) resident in the counties of St Andrew and St. David in eastern Trinidad and enrolled to receive assistance from the State, through the Ministry of the People and Social Development,

formerly Ministry of Social Development, Social Welfare Division, Sangre Grande. The sample size was determined on the basis of the population size, the geographical distribution of the population, and the resources available to the study. A three-stage sampling design was used to select 300 community dwelling old age pension recipients, 65 years and older, who were interviewed. The residential distribution of the respondents was as follows: 100 were resident in the main District of Valencia, 100 were resident in the main district of Manzanilla, and 100 were resident in the main district of Toco/Matelot.

- *The Questionnaire*

  The questionnaire used in the survey was developed and pre-tested with 15 old age pensioners to determine its appropriateness and suitability for the survey population. The questionnaire was designed to provide information on the personal and socio-economic characteristics of the respondents; their housing satisfaction and quality status; their physical and mental well-being; and their levels of aspiration.

- **Conduct of the Survey**

Face to face interviews were conducted with older persons at the respondents' home. The respondents were assured of the confidentiality of the information collected in the survey. There were 300 respondents in the survey and the non-response percentage was 21 %. The survey was conducted during the months of September to November, 2004. The investigator and a trained research assistant/interviewer administered the questionnaires.

- **Procedures for the Derivation of Variables in the Study**

  - *Housing Quality Index (HQI) Score*

Data for the determination of the HQI score of respondents were obtained through a set of 21 questions (which included 32 items or variables). The questions enquired about the respondents' housing tenure, type of dwelling and the physical characteristics of their houses, which included the physical structure, types of materials used, the number of rooms, and the utilities and basic amenities present. Twelve questions were selected from the Trinidad and Tobago, Central Statistical Office (CSO), 1990 Population and Housing Census. These were designed to obtain information on the physical condition of the respondents' dwelling units, namely tenure, type of dwelling, number of rooms, average size of rooms, housing material used for the roof, flooring, outer walls; toilet facilities, water supply and garbage disposal.

Actual observations of the external and internal aspects of the respondents' dwelling units during the interviews were utilized to verify the responses about the conditions of these dwelling units. Other questions were related to the location of the house, travel time to the nearest Health Center or Hospital and the level of crime in the area in which the house was located. Four questions also obtained data on the respondents' satisfaction or dissatisfaction with their current housing. Each question was closed with categories that were then scaled to determine a HQI.

From the 21 questions and 32 items on housing quality, a HQI was constructed. The initial step involved the scaling of the categories for each of the items so that the highest score reflected the highest quality with respect to housing for that item. The next step involved the calculation of the maximum aggregate raw score and the minimum aggregate raw score for all the 32 items. The minimum aggregate raw score was 19 and the maximum aggregate raw score was 110. The raw score range (91) was determined by subtracting the maximum aggregate raw score from the

minimum aggregate raw score. To transform the aggregate raw score for respondents to a 0 – 100 score the following formula was applied:

$$Transformed\ Score = \frac{\left[Respondents'\ Aggregate\ Raw\ Score - Minimum\ Aggregate\ Raw\ Score\right] \times 100}{Raw\ Score\ Range}$$

Respondents receiving a transformed score of 70 and below were considered to have poor housing conditions. Respondents receiving a transformed score between 71 and 80 were considered to have fair housing conditions. Respondents receiving a transformed score between 81 and 90 were considered to have very good housing quality, and respondents receiving a transformed score greater than 90 were considered to have excellent housing quality. The value of the transformed score was used as the HQI score in the regression analysis. To assess the degree to which the multiple measures or items comprising the HQI agree with one another, Cronbach's standardized alpha test of reliability analysis was conducted.

- *Physical and Mental Well-Being*

The SF-36 V2 Survey Questionnaire (SF-36 V2 "Acute Self Report for Your Health and Well Being - One Week Recall)" developed by Ware, Kosinski, and Dewey (2000) was used to obtain information on the physical and mental well-being of respondents. The SF-36 V2 questionnaire consists of 11 questions which yielded 36 items or variables, which were used to generate a mental component score/summary (MCS) and physical component score/summary (PCS) for each respondent.

The respondents were first cautioned that some questions may seem to be alike, but nevertheless they should answer all the questions. Then the first question asked the respondents to assess their current general state of health (1 item-gh1). Then the next question enquired about their general health now compared to a week ago (1 item). The next question obtained information on the extent to which their health or health problems limited their physical activities in everyday life, such as: climbing stairs, walking, lifting and carrying groceries, bending etc. (10 items-PF). The next question asked if their physical health limited the extent to which they could perform work or other activities (4 items-BP)

The next question enquired about their mental health and enquired if they felt that emotional problems in the past week had limited their work or other regular daily activities. (3 items-RE) The next question asked about the extent to which the respondent considered that physical health or emotional problems had interfered with normal social activities with friends, families etc (1 item-sf1). The next two questions (#7 and #8) enquired about the extent to which the respondent had experienced bodily pain during the previous week and the extent to which this pain interfered with normal work inside and outside the home (2 items-BP).

The next question (#9) enquired about the vitality and metal health of the individual specifically how they felt over the past week, in terms of being: "full of life", "calm and peaceful" or "downhearted and depressed" etc (9 items-V and MH). The next question enquired if their physical health or emotional problems limited their social activities (1 item-sf2). Finally in the last question, the respondents were again asked to reflect on their general current health and their expectations for their future state of health (4 items-gh2).

The scores on the eleven questions were organized into eight raw scores using combinations of items of the questions to measure the following:

- Physical Function (PF)
- Role Physical (RP)
- Bodily Vitality (BP)
- General Health (GH, consisting of gh1 and gh2)
- Vitality (VT, consisting of 4 items of question 9)
- Social Functioning (SF, consisting of sf1 and sf2)
- Role Emotional (RE), and
- Mental Health (MH, consisting of 5 items of question 9)

The eight raw scores were then standardized using means and variances from a 1998 study of the general population of the United States.[1] This process created eight standardized (z) scores (PF_z, RP_z, BP_z, GH_z, VT_z, SF_z, RE_z and MH_z). The eight standardized (z) scores were then aggregated to obtain an Aggregate Physical score and Aggregate Mental score by the following formulas, which are weighted sums of the standardized scores.

$$\text{AGG\_PHYS} = (\text{PF\_z}*.42402) + (\text{RP\_z}*.35119) + (\text{BP\_z}*.31754) + (\text{GH\_z}*.24954) +$$

$$(\text{VT\_z}*.02877) + (\text{SF\_z}*-.00753) + (\text{RE\_z}*-.19206) + (\text{MH\_z}*-.22069)$$

$$\text{AGG\_MENT} = (\text{PF\_z}*-.22999) + (\text{RP\_z}*-.12329) + (\text{BP\_z}*-.09731) + (\text{GH\_z}*-.01571) +$$

$$(\text{VT\_z}*.23534) + (\text{SF\_z}*.26876) + (\text{RE\_z}*.43407) + (\text{MH\_z}*.48581)$$

The final step involved transforming each aggregate score to the norm based (Mean =50, standard deviation= 10) score to yield the PCS and MCS scores for each respondent. This transforms the aggregate z score back to a raw score and was carried out as follows:

$$\text{PCS} = 50 + (AGG\_PHYS * 10)$$

$$\text{MCS} = 50 + (AGG\_MENT * 10)$$

In the application in the survey, the PCS and MCS scores were calculated for each respondent based on their actual responses to the questions described earlier.

- *Housing Satisfaction*

The respondents were asked to express their level of "satisfaction" or "dissatisfaction" with the house in which they resided. They were also asked the reasons for any dissatisfaction with their housing. They were also asked about their level of satisfaction or dissatisfaction with the area in which the house was located and the reasons for any dissatisfaction. The responses were analyzed by frequency. A chi-squared was conducted to test the significance of the relationship between housing quality index score and the housing satisfaction analysis of the respondents.

[1] This standardization for respondent *i* using the standard normal distribution was obtained as follows: $\text{Standardized(z)Score}_i = \frac{\text{Raw Score}_i - \text{US Population Mean Raw Score}}{\text{US Population Standard Deviation of Raw Score}}$.

- *Level of Aspiration*

The measurement of the level of aspiration required four questions. The respondent was first asked about what they considered to be the "best possible life" for themselves and then what they considered to be the "worst possible life" for themselves. These open–ended questions gave respondents the opportunity to express their personal values, desires and expectations for the future as well as their personal doubts and fears. The Self- Anchoring Scale of Kilpatrick and Cantril (Pemberton, 1985) was then used. The respondents were presented with a pictographic scale in the form of a ladder, numbered from zero to ten, with the top of the ladder (10) representing their best possible life and the bottom of the ladder (0) representing their worst possible life. The respondents were then asked to show where they think their lives are currently, using the scale and where they think their lives would be in five years' time. The present life score provides an indicator of the individual's evaluation of the current status of their life. The life score after five years provides a generalized measure of the respondent's level of aspiration.

- **Statistical Analysis**

The data was coded and analyzed using the Statistical Package for the Social Sciences for Windows (SPSS) (Version 11.0). Frequency distributions and means were estimated for selected variables and contingency tables constructed and the association between variables tested using chi-squared analysis. Multiple linear regression analysis was carried out to determine the factors that determined the HQI score of respondents. The independent variables used were as given in the model in Figure 2. A level of significance of 10 % was used for all tests of hypotheses.

Equation 1 shows the model that was estimated using the statistical program GRETL:

$$lHQI = \beta_0 + \beta_1\, yrsc + \beta_2\, pwo + \beta_3\, lage + \beta_4\, sex + \beta_5\, lfls + \beta_6\, lia + \beta_7\, linc + \beta_8\, lPCS + \beta_9\, MCS + \varepsilon \quad .... \qquad (1)$$

Where:

$lHQI$ = log of the Housing Quality Index Score

$yrsc$ = log of the number of years spent in school

pwo = employment dummy variable, where if respondent presently working = 1; Otherwise = 0

age = log of the age of the respondent

sex = gender dummy variable, where Female = 0; male = 1

$lfls$ = log of life score after five years

lia = living arrangement dummy variable, where if the respondent lives alone = 1; Otherwise = 0

$linc$ = log of the paid income of respondent

$lPCS$ = log of Physical Component Summary (PCS) scale score of respondent

$lMCS$ = log of Mental Component Summary (MCS) scale score of respondent

Tests of the individual regression coefficients were carried out, along with a test of the overall significance of the regression model. Additionally, tests were also carried out for heteroscedasticity, multi-collinearity and auto-correlation.

Results

- **Survey Results**

The study sample consisted of 145 (48.3%) men and 155 (51.7%) women. The mean age of the respondents was 75.88, SD (6.77) (ranging from 65 to 103). More male respondents were found in the age group 65 to 74, while female respondents were found to be generally older than the men. The largest ethnic group was African 56.3%, followed by Mixed 22.3 % and East Indian 19.7%. The majority of the respondents 75.3 % did not live alone.

Of the respondents, 31.6 % were widowed, 10.3 % were widowers, 28 % were married, 9.7 % separated and 9.3 % were single, with 9.0 % being in a common-law relationship, and 2.0 % were divorced. The majority of respondents 82.7 % had attained a primary school education, while only 3.0 % attained secondary school education, 0.3 % attained technical/ tertiary education, and 14.0 % had not attended school.

For all respondents a source of monthly income was old age pension, which was in the TTD$501.00 to $1000.00 (USD $79.00 to 158.00) range. The other major source from which 44.6 percent of respondents received monthly income, was National Insurance payments, which ranged from less than $500.00 to $1000.00 (USD $79.00 to 158.00). Sixty-eight (11.3%) of respondents received income from gardening, while 16.3 % of respondents received income from other sources, such as part-time and full-time employment, business, transporting, private charity, members of their family and 'volunteering'.

As seen in Table 1, the mean PCS for respondents in the sample was 43.76 and the mean MCS was 50.70 which means that older persons considered themselves to be in poorer physical health than the general US population (PCS Mean = 50) and in about the same state of mental health (the general US population MCS Mean = 50). However, when compared with the US population ages 75 and over, they considered themselves to be in better health (US PCS 75 and over, 41.14) but in poorer mental health (US MCS 75 and over, 51.55) (Ware, Kosinski, and Dewey, 2002, p. 96). The mean HQI score of the sample was 68.69 with a standard deviation of 13.31.

Table 1 also shows that the mean level of aspiration (life score in five years' time) of the sample was 6.28 with a standard deviation of 3.40 while the mean present life score was 6.59. Thus on average older persons saw their lives getting worse over the next five years. The major worries and fears for the future (in order of importance) were crime, housing, health, financial insecurity and loneliness. The major wishes and hopes they had for the future (in order of importance) were (good) health, better housing, financial security and to be comfortable.

Table 1. Sample Characteristics (n = 300)

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	75.88	6.77	65	103
Gender	0.48	0.501	0 (Female)	1 (Male)
Do you Live Alone	0.25	0.432	0 (No)	1 (Yes)
Are you Working	0.13	0.333	0 (No)	1 (Yes)
PCS	43.76	11.77	13.30	66.36
MCS	50.70	11.87	12.22	75.51
HQI	81.51	13.31	34.07	90.11
Present Life Score	8.82	2.81	0	10
Life Score in five (5) years' time *(Level of Aspiration)*	6.28	3.40	0	10

- **Agricultural Activities conducted by Older Persons**

Few respondents 24.3% reported positively having a kitchen garden, while the majority of respondents 75.7% reported no involvement in planting a kitchen garden as shown in Table 2.

Table 2: Number of Respondents who Plant a Kitchen Garden

Response	Frequency	Percent (%)
No	227	75.7
Yes	73	24.3
TOTAL	300	100

As presented in Table 3, the results showed that most respondents' 28.8 % reported growing vegetables such as, lettuce, tomatoes, sweet peppers, bodi, ochro, eggplant, patchoi etc., while 34.9% reported growing starchy vegetables such as corn, pumpkin, pigeon peas, avacado, chataigne, plantain and ground provision such as dasheen, eddoe, yam and sweet potato.

Table 3: Type of Food Grown by Respondents

Food Item	Frequency	Percent (%)
Ground provision	49	16.3
Starchy Vegetable	53	18.6
Vegetables	92	28.8
Fruit	22	7.3
Total	216	72
Not Applicable	84	28
TOTAL	300	100

Approximately 13.7% of respondents reported positively, as having kept animals for sale, while the majority of respondents 86.3% reported not keeping animals for sale, as shown in Table 4.

Table 4: Number of Respondents who kept Animals for Sale

Response	Frequency	Percent (%)
No	259	86.3
Yes	41	13.7
TOTAL	300	100

As shown in Table 5, most respondents 11.3% reported rearing chickens. While 8.1% of respondents reared either ducks, pigs, rabbits, goats and cattles.

Table 5. Type of Animals Reared

Type of Animal	Frequency	Percent (%)
Chicken	33	11.3
Ducks	15	5.1
Pigs	4	1.3
Rabbit	3	1
Goat / Sheep	2	0.7
Cattle	3	0.9
Total	60	20.3
Not Applicable	240	80
Total	300	100
System Missing	1	
Total	300	100

As shown in Table 6, 45.0 % of the respondents had a poor HQI score, 32.7 % of respondents had a fair HQI score, and 22 % of respondents had a good HQI score. The Cronbach's Alpha value at 0.724 indicated that the items included in the HQI are closely related as a group or that there is internal consistency in the elements that comprise the index. A value above .70 is considered acceptable.

- **Older Persons Satisfaction with Housing**

The majority of respondents 93.7 % lived in a separate or single family house. As seen in Table 6, most respondents 67.7% (203) were at least satisfied with the house in which they lived, 27.7 % (83) were very satisfied. 10 % (30) of respondents were dissatisfied, and 22.3 % (67) were very dissatisfied with their housing. A chi-square test in Table 6 showed a significant relationship

between the HQI score and housing satisfaction of respondents with respondents in better housing being more satisfied with the house they live.

Table 6. Cross-tabulation - Housing Quality Index Score vs. Are You Satisfied with the House in Which You are Living In?

		Are you satisfied with the house in which you are living in?				Total
		Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied	
Housing Quality Index Score*	<70: Poor	61	17	48	8	134
	70-80: Fair	5	12	48	33	98
	>80-90:Good	1	1	24	40	66
	>90:Very Good Excellent	0	0	0	2	2
Total		67	30	120	83	300
Pearson Chi-Square: 122.2819[a]; DF: 9, p-value = 0.000						
Likelihood Ratio: 136.4903; DF: 9, p-value = 0.000						
*Note: Cronbach's Alpha based on Standardized Items = 0.724						

In response to the question about the reason for the respondents' dissatisfaction with the house in which they live, 12.8 % of respondents reported that their properties were in need of major and expensive repairs, 11.8 % reported that the roofs were in poor condition, 11.3 % reported that the walls were in poor condition, 11.3 % of respondents reported that the floors were in poor condition, 11.3 % reported a lack of plumbing/toilet facilities and 7 % reported the high cost of maintaining the property.

In response to the question about respondents' satisfaction with the location of their house, the majority of respondents, 98.7 % were satisfied with the area in which their house was located. The respondents dissatisfied with the location of their house, reported that their neighbourhoods had become unsafe.

- **Regression Results**

In Table 7, the Durbin-Watson and the Lagrange Multiplier (LM) tests showed the absence of autocorrelation. However, the White's general heteroscedasticity test rejected the null hypothesis of no heteroscedasticity. As a consequence the standard errors of the regression coefficients were corrected using Heteroscedasticity- Robust Standard Errors.

Table 7. Test for Autocorrelation and Heteroscedasticity

Durbin-Watson	1.8758	rho	0.0609
LM test for autocorrelation	1.0955	p-value	0.2961
White's test	77.8194	p-value	0.0092

Table 8 shows the results of the multiple linear regressions explaining the respondents' HQI scores. The results of the test of significance of the individual regression coefficients found that the number of years in school, whether the respondent lived alone or not, gender and the paid income had very significant impact on the HQI scores of the individuals.

Table 8. Housing Quality Index (HQI) Linear Regression

OLS, using Observations 1-300 **Dependent Variable: *l*HQI** **Heteroskedasticity-Robust Standard Errors, Variant HCl**					
	Coefficient	**Standard Error**	**t-ratio**	**p-value**	
Constant	3.607	0.540	6.678	<0.00001	***
*L*yrsc	0.035	0.006	5.337	<0.00001	***
Pwo	-0.054	0.036	-1.511	0.132	
*L*age	0.054	0.098	0.552	0.581	
Sex	-0.057	0.018	-3.233	0.001	***
*L*fls	0.012	0.009	1.251	0.212	
Lia	-0.107	0.022	-4.830	<0.00001	***
*L*inc	0.132	0.038	3.448	0.001	***
*l*PCS	-0.052	0.029	-1.777	0.077	*
*l*MSC	-0.053	0.037	-1.437	0.152	

Mean dependent variable	4.389	S.D. dependent variable	0.161
Sum squared residual	5.826	S.E. of regression	0.142
R-squared	0.244	Adjusted R-squared	0.221
F(9, 290)	11.456	P-value(F)	0.000
Log-likelihood	165.541	Akaike criterion	-311.082
Schwarz criterion	-274.044	Hannan-Quinn	-296.259

The number of years spent at school and paid income were positive, in keeping with theory, indicating that older respondents with more years of schooling were very much more inclined to have higher HQI scores than the older respondents with less years spent at school, similarly, older respondents with greater paid incomes, were more inclined to exhibit higher HQI scores than the older respondents with lower paid incomes. The living alone coefficient was negative suggesting that the older respondents who lived alone had very significantly lower HQIs in comparison to the older respondents who lived with families. Also male respondents had very significantly lower HQI scores than female respondents.

The Physical health score significantly affected the housing quality of the respondent with an unexpected negative relationship between the variables. The Mental health score did not significantly affect the HQI of the respondents and it was also found that the HQI scores of the respondents were not influenced by the age of the respondent or whether the respondent was working. The future life score as the measure of the level of aspiration of the individuals also did not have a significant impact on the HQI scores of the respondents.

In terms of the magnitude of the effects of the factors in the HQI it was found that the effects were all inelastic so that changes even in the significant factors would not have large impacts on the HQI. For example, a 10 % increase in the paid income of the respondents would only lead to a 1.3% increase in their HQI, score. The responses of the HQI scores to changes in the other variables were even much smaller.

Conclusions

In this study, 67% of respondents indicated they were at least satisfied with the house in which they lived; given the fact that the majority of respondents owned or lived in separate or single family homes. This finding is in keeping with Wilson and Aspinall (1995) who reported that home ownership and house type influenced the level of satisfaction experienced among the elderly. For the respondents dissatisfied with their housing, 32% reported the need for major and expensive repairs to be carried out on their homes, relating to the poor condition of the roofs, walls and flooring and lack of indoor and outdoor plumbing facilities. In addition, the costs of maintaining their properties were of major concern for most respondents. Similarly, Wilson and Aspinall (1995) reported that housing satisfaction among older persons decrease when their home or residence contains defects and deficiencies relating to the infrastructure or amenities.

With regard to respondents' satisfaction about the area in which their houses were located, the majority (97%) was satisfied; having good neighbors and being familiar with their environment contributed to the satisfaction with their housing location. These findings are consistent with Wilson and Aspinall (1995) who reported that features ranging from being able to view the street and people's activities along with the presence of neighbors and access to public transport, all contribute to increasing housing satisfaction among the elderly. The respondents dissatisfied with the location of their house, reported that their neighborhoods had become unsafe. This finding is consistent with Wilson and Aspinall (1995).

The research findings reveal that for most of the respondents their housing quality status was ranked as "poor". A smaller percentage was ranked as "fair" and a lesser number were ranked as "good". The mean HQI score for the study population was 68.68, with a standard deviation of 13.31. The survey results revealed that the majority of respondents (81%) were living in houses that were not good. These findings are consistent with Potter (1992), Fiadzo (2004) and PAHO

(1989) that older people tended to have lower HQI scores than the younger age groups, and that the HQI score was worse in rural areas.

There was very strong evidence that the respondents who were satisfied with the houses in which they lived had higher HQI scores. These findings are consistent with the findings of The Housing Assistance Council (2001) regarding housing preferences of rural older persons, which state that many older persons live in old houses that may have structural and physical inadequacies. Yet, most seniors who live in substandard housing tend to express their contentment and desire to stay. This attachment, even though they face insufficient housing, is frequently associated with factors such as money, differing definitions of quality and the fear of losing their independence.

The very significant predictors of rural older persons housing quality status were the number of years spent in school, whether the respondents lived alone, gender and the income of the respondent. The significance of number of years spent in school is consistent with study findings by Fiadzo (2004) and Conley (2001) on educational attainment and HQI scores. With regard to gender and housing quality status, similar findings were reported by Fiadzo (2004), which found that households headed by females exhibited higher HQI scores than their male counterparts. The results also showed the respondents who were not living alone had better HQI scores.

Recommendations

The results from this study point to the types of changes required to improve the satisfaction with housing, the housing quality status and the overall quality of life for rural older persons in Trinidad and Tobago. A role for the Ministry of Housing could be to review the existing housing policy and programmes for the low-income older persons in Trinidad and Tobago. This review could focus on several factors. Firstly, the development and implementation of a comprehensive National Housing Policy for older persons is required. This policy could serve as a platform for the implementation of effective measures for the sustainable development of housing for older persons in Trinidad and Tobago. Some areas for consideration in the policy include the following:

- The utilization of the HQI developed in this study as a National Housing Quality Index. This index can be used to identify homes for renovations through the Community Housing Revitalization Program.
- The development and implementation of a Community Housing Revitalization Program for the refurbishment or building of suitable homes and accommodation for older low-income dwellers. This program should also assist older persons to continue living in their homes for a longer period.
- The passage of appropriate legislation that could require partnering between the Government and private stakeholders (Housing Contractors) who are knowledgeable about current trends in design and construction of older persons homes. In this way older persons could receive assistance from Government by way of suitable or improved housing, even if they make use of the services of private contractors.
- The Government should explore the option of a housing equity programme with low-income rural community dwelling older persons. Such an initiative could involve a system of part or full ownership of housing stock/property by the Government. In this way, older persons, low-income, rural community dwellers who cannot maintain their properties can

enter into an arrangement with Government to use their homes as equity for their housing and healthcare needs.

- Income increases via an increase in Old Age Pension and National Insurance Scheme (NIS) payments can improve housing satisfaction, which will contribute to improved housing satisfaction.
- Inclusion of older persons in agricultural extension programmes that recognise and work with their substantial knowledge and experience that would contribute to a sustainable future
- Implementation of credit and agricultural input schemes to be made much more age-inclusive
- Development and implementation of programmes to capture the knowledge and experience of older farmers, women and men, of conservation farming techniques and weather patterns.
- Finally, it is recommended that a national housing education programme should be developed with a specific component targeted at older persons to heighten awareness of housing care and maintenance.

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Appendix

Deficiencies which cause a housing unit to be judged physically inadequate - based upon Annual Housing Survey items and a revised definition (1981)

Type of Deficiency	Description of Deficiency
Plumbing	**1.** Lacks or shares some or all plumbing facilities. The unit must have hot and cold piped water, a flush toilet, and a bathtub or shower – all inside the structure and for exclusive use of the unit. **2.** Lacks adequate provision for sewage disposal. The unit must be connected with a public sewer, septic tank, cesspool or chemical toilet. (Units with this deficiency also are almost invariably defined as having a plumbing deficiency). **3.** Had breakdown of flush toilet for six consecutive hours or longer three or more times during last 90 days.
Kitchen	**4.** Lacks or shares some or all kitchen facilities. The unit must have an installed sink with piped water, a range or cookstove, and a mechanical refrigerator – all inside the structure and for exclusive use of the unit.
Physical Structure	**5.** Has three or more of six structural problems; leaking roof; open cracks or holes in interior wall or ceiling; holes in the interior walls; either peeling paint or broken plaster over one square foot of an interior wall; evidence of mice or rats in last 90 days; leak in basement.
Common Areas	**6.** Has three or more of four common area problems: no light fixtures (or no working light fixtures) in common hallways; loose, broken, or missing stair railings, no elevator in building (for units two or more floors from main building entrance in buildings four or more stories high).
Heating	**7.** Has un-vented rooms, heaters which burn oil or gas. If unit is heated mainly by room heaters burning gas, oil, or kerosene, the heaters must have flue or vent. **8.** Had breakdown of heating equipment for six consecutive hours or longer three or more times during last winter.
Electrical	**9.** Lacks electricity. **10.** Has three out of three signs of electrical inadequacy: one or more rooms without a working wall outlet; fuses blown or circuit breakers tripped three or more times during last 90 days; exposed wiring in house.

Source: McKean Simonson (1981), pp. 84–85

Appendix-Table 2

Items comprising the Housing Quality Index - Barbados

Item	Description of Item
1. Type of Dwelling	relates to the building or part of the building used for residential accommodation by private households: whether separate house; flat/apartment; town house; double house/duplex; part of commercial/industrial building; barracks; out-room; group dwelling; other private dwelling; no fixed abode.
2. Tenancy/Type of Tenure	refers to the conditions and/or living arrangements under which a private household occupies all or part of a dwelling unit, as well as the land on which the dwelling unit stands: whether owner-occupied; leased; rented/private; rented/government; rent free; squatted.
3. Water Supply	refers to the water supply system to the dwelling unit: piped into dwelling (from public or private source) public piped into yard; private catchments not piped; public stand pipe; truck-borne; spring/river.
4. Toilet Facility	refers to: pit latrine; W. C. linked to sewer; W.C. not linked to sewer.
5. Age of Building	refers to: the date or year when the original building/dwelling was completed.
6. Material of Outer Walls	refers to: brick; concrete including concrete blocks with steel reinforcement and or reinforced concrete; wood and concrete; wood only; wattle/adobe/tapia.
7. Number of Rooms	refers to: a space in a dwelling unit enclosed and permanently separated by means of walls, from outer parts of the building, but excludes galleries, bathrooms, toilets, storerooms, laundry rooms, pantries and corridors. The rooms (bedroom and kitchen) should be at least four (4) square meters in area, exclusive of corridors.
8. Type of Lighting and Fuel for Cooking	with respect to lighting, whether this is through: electricity, kerosene, other means; With respect to cooking fuel whether: gas (eg. lpg, propane etc.), electricity, wood/charcoal, kerosene, other.

Source: Population Census of the Commonwealth Caribbean (1980/1981)