

A Tool For Rapid Socioeconomic Assessment

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ABSTRACT

Objective. To validate a simple wealth index scale (WIS) based assessment of socioeconomic status and compare it with existing kuppuswamy(KUP) scale.

Methods. Families of 300 children aged 6 to 59 months of acute diarrhoea enrolled in a cross-sectional study were interviewed for socio economic status using both 8 item ownership scale (WIS) and Kuppuswamy (KUP) scale, validated against a reference standard Income Scale (IS).

Results. Out of 111 people classified as low based on Income scale (IS), 17% were identified by WIS, and 21% by KUP. In the upper low, 69.4% were identified by WIS and 84.3 % by KUP. Amongst the low middle group the WIS identified 27.6% while KUP identified 10.6% and amongst upper middle patients 30% were identified by WIS and 15 % by KUP. There were none in the upper income of WIS or KUP category. The WIS performed well in all income categories whereas the KUP was better for upper low and low income categories. The agreement between WI and KUP was 55.56%.

Conclusion. KUP scale is lengthy and difficult to administer by pediatric students and biased towards professional qualifications and education, rather than actual standard of living. It can be replaced by a simple 8 item ownership scale (WI) which is robust for all income groups and also shows good agreement with KUP.

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Key words: Kuppuswami scale; Wealth index; Socioeconomic status

A strong causative effect of income on infant mortality, malnutrition and related infectious illness has been demonstrated. Therefore the socioeconomic status is a perennial variable required to be measured by all under- graduate and postgraduate pediatric students. Traditionally the modified Kuppuswami Scale^{1,2} (KUP) has been used for determining the socioeconomic status of the patient. This scale is a composite score of per capita monthly income, education of the head of the family and profession of the head. It gives us a maximum score of 29 and a lowest of 3. It has been used for the past two decades. A good scale needs to evolve and be robust over time to capture the change in economic conditions of individuals. Also it should be able to assess the economic status of urban as well as rural populations. The KUP scale primarily measures socio economic status of urban population, lays

emphasis on professional education and occupation of the head of the family and may not have the same relevance today. Thus an uneducated, unskilled member of the family with a high income from a family business is likely to be in the upper low category, even though he has good standard of living and can afford good health care. It therefore, does not necessarily reflect the standard of living or other human development indicators such as sanitation and health. Conversely well- educated and skilled persons may remain jobless with poor incomes and poor standard of living. The Kuppuswami scale is also cumbersome to remember. It has values for 3 different parameters that make up a composite score which then is classified into various classes such as low, upper low, low middle, upper middle and upper. Moreover the consumer price index has to be determined to multiply the income groups to get the appropriate groups for that year.³ Accurate measurement of family income is also difficult. Since family income is personal, people tend to understate or inaccurately state their family income due to previous high taxation levels or due to subsidies offered to lower

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income groups by the government. Therefore their standard of living is under valued many instances. The National Family Health Survey has used a 9 item scoring system which has good validity, is reliable but lengthy⁴. The World Bank has used household ownership to assess socioeconomic status, standard of living, and its impact on health care^{5,6}. Wealth ranking, also known as wellbeing ranking or vulnerability analysis, is a technique for the rapid collection and analysis of specific data on social stratification at the community level.⁶ This visual tool minimizes literacy and language differences of participants as they consider factors such as ownership or uses rights to productive assets, lifecycle stage of members of the productive unit, relationship of the productive unit to locally powerful people, availability of labor, and indebtedness. The objective of the present study was to develop and use a simple 8 item ownership score to assess the socio-economic status which medical students can use, instead of the lengthy Kuppuswami scale, for quick socioeconomic assessment in both urban and rural population. We compared the performance of this scale with that of the currently used Kuppuswami Scale and a reference Income Scale (IS)

MATERIAL AND METHODS

In the present study of acute diarrhoeal diseases in a tertiary care hospital we developed a scale (Wealth Index Scale) on basis of 8 item ownership to reflect standard of living. Children aged 6 months to 5 years of age were enrolled and the families were interviewed for acquiring baseline data on type of housing and possessions. We validated this scale (WIS) with a reference Income scale (IS) and also compared it to the Kuppuswami scale (KUP).^{1,2,3}

The reference Income Scale (IS) was developed as follows, using an existing valid and reliable methodology.⁷ A list of 25 household items was obtained and randomly selected respondents were interviewed regarding the utility of these items in a house. They were categorized as essential (E), useful (U) and non essential (NE), if more than 50% of the respondents felt that they were in that category. Next they were asked

whether they possessed the items. Their income was also obtained. The percentage ownership of each category was calculated for each respondent, e.g., 3 out of 4 E was 75%, and 7 out of 14 NE was 50 % ownership of that category. The 10th percentiles of income and percentage ownership in each category E, U, and NE was calculated. Four cut offs of income (10th, 40th, 70th and 80th percentile) gave five groups Low (< \$1/day or < Rs.1500 per month⁸), Upper Low (Rs.1500 to < 3000 per month or \$2/day)⁸, Low Middle (\geq Rs. 3000 to < 9000), Upper Middle (\geq Rs.9000 to < 15000), Upper (\geq Rs. 15000). The Low category corresponded with < 75 % of ownership of essential items (E), < 50% of U and < 30% of NE. The Upper Low corresponded with ownership of 100% of E, < 75 % of U and < 50% of NE. The Low Middle corresponded with ownership of 100% E and U and 50-70% of NE. The Upper Middle corresponded with ownership of 100% E and U and 70-90% of NE. The Upper corresponded to ownership of all E and U and > 90% of NE items. This was the reference Income Scale (IS). The WIS was as follows : the ownership of 1 Essential (E) item i.e electricity, 5 Useful (U) items i.e radio, bicycle, television, scooter and land and 2 Non essential (NE) items i.e car and refrigerator were assessed. A person is considered in "Low" if they did not have electricity (E), "Upper Low" category if they had electricity and less than 2 U but no NE, "Low Middle" if they had electricity and more than or equal to 2 U and no NE, "Upper Middle" if they had electricity more than 2 U and 1 NE, "Upper" if all E, all U and all NE. 298 families of children in the study were administered both the WIS and KUP. The agreement of these two scales with IS and with each other was calculated and kappa statistics reported.

RESULTS

Table 1 shows overall 43% agreement of WIS with IS. The percentage agreement was 17% for Low, 72 % for Upper Low, 27% for Lower Middle, and 33% for Upper Middle. Table 2 shows overall 48% percent agreement of IS with Kuppuswami. The percentage agreement was 21% for Low, 85% for Upper Low, 11% for Lower Middle, and 16% for Upper Middle. There was no significant difference between the percentage of

TABLE 1. Agreement of IS with WIS

IS	LOW	UP LOW	LOW MIDDLE	UP MIDDLE	TOTAL
WIS					
LOW	19	13	6	1	39
UPPER LOW	78	88	26	2	194
LOW MIDDLE	12	17	16	1	46
UPPER MIDDLE	2	4	11	2	19
TOTAL	111	122	59	6	298

Agreement 42.62% Expected agreement 36.71%

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TABLE 2. Agreement of IS with KUP

KUP	IS				TOTAL
	LOW	UP LOW	LOW MIDDLE	UP MIDDLE	
Low	24	13	3	0	40
Up Low	87	104	48	4	243
Low Middle	0	5	7	1	13
Up Middle	0	0	1	1	2
Total	111	122	59	6	298

Agreement 47.99% Expected agreement 42.37%

TABLE 3. Agreement of WIS with KUP

Wis	Low	Up Low	Low Middle	Up Middle	Total
KUP					
0	5	32	3	0	40
1	34	155	40	14	243
2	0	7	2	4	13
3	0	0	1	1	2
Total	39	194	46	19	298

Agreement 54.70% Expected agreement 55.56%

agreement in “Low” category of WIS with IS and Kuppuswami and IS. It was significantly higher for Upper Low in Kuppuswami ($p=0.001$), and significantly higher for Low Middle and Up Middle in WIS ($p=0.001$). The overall agreement of KUP with WIS was 55 %.

DISCUSSION

The aim of the study was to devise a simple new scale which could quickly measure the standard of living as a proxy to the socioeconomic status of a family for pediatric history taking by medical students. This scale can be used in rapid community surveys both in urban and rural population. The WIS used in this study was simple, and more accurately measured the Low Middle and Upper Middle as compared to the KUP with respect to the reference scale. This was because the KUP is biased towards type of education and profession. The consumption of goods is directly proportional to the socioeconomic status which also influences accessibility, affordability, acceptability and utilization of health care. The KUP indicated that it is a poor measure of ownership or consumption of items and less likely therefore to also reflect on health care consumption. Also the WIS was similar to KUP (55% percent overall agreement) in categorizing the persons in the five socioeconomic group but required much less information and was easy to administer, and did not ask personally embarrassing question regarding income.

The Standard of Living index (SLI) used by the

NFHS has 11 items based on ownership and facilities available to the household.⁴ By this measure, 14% have a low standard of living, 47% medium standard and 39 % high standard of living in urban areas in India. Both the WIS scale and Kuppuswamy scale identified 13% of respondents as “Low”, which is similar to that by SLI. Accurate identification of this category is important as it is most relevant to health indices. The simplified WIS was able to achieve it. There was no significant difference in identifying respondents in “Low” category by both the scales (WIS and KUP) as compared to reference IS scale. However, WIS better identified respondents in Low Middle and Upper Middle as compared to Kuppuswamy which was biased towards Upper Low as it gives little importance to possessions and more to level of education. Health status is determined by social structures and by the options available to people to participate and influence the society in which they live and work.⁹ The higher the standard of living the better the living conditions, lower disease prevalence and better health services utilization. Hence standard of living is a better indicator of health status. A person is considered poor if his or her consumption or income level falls below some minimum level necessary to meet basic needs.⁸ High costs of living and prohibitive rents compel people to live in dilapidated slum homes. However, they have reasonable incomes and own consumer durables. Similarly they pay for health care. Another instrument of 22 items, a maximum aggregate score of 100 to divide the families into six socio economic states was developed by Aggarwal *et al* and assessed the socioeconomic status of rural and different urban populations. It was a comprehensive scale which measured the status with greater accuracy because it included many dimensions of standard of living in addition to income, occupation and profession. However, it is extremely difficult to use this scale for a rapid assessment by a community health worker or by a medical student.¹⁰ Our scale also has limitations. The goods that are categorized as non essential today may become essential with improvement in standard of living. So stability of an ownership scale and the categorization of the goods over time needs repeated evaluation based on information of change in standard of living of the population being assessed. Secondly,

this scale assumes that most families would have purchased the goods, and not obtained them by generous gifts, donations or lucky draws.

From the above results, it appears that using a household possession index can predict socioeconomic status almost as accurately, if not better than the Kuppuswami scale. To determine the socioeconomic status of a person or family, knowing the possessions could be sufficient without having to inquire about their monthly earnings. Moreover no complex calculations are involved, such as the need for any CPI correction. This WIS scale can be tried on larger populations to further validate it. The authors recommend that this simple tool be used by students, health personnel and community workers, to assess its reliability and validity.

REFERENCES

1. Kuppuswami B. Manual of Socioeconomic scale (Urban), New Delhi, Manasayan, 32, Netaji Subhash Marg, 1981.
2. Mahajan BK ,Gupta MC, Textbook of preventive and social medicine. Delhi 2nd edn. Jaypee Brothers, 1995; 134-135.
3. Mishra D, Singh H. Kuppuswamy socioeconomic status scale – a Revision. *Indian J Pediatr* 2003; 70 : 273-274.
4. National Family Health Survey-2, 1998-1999. *International Institute of Population Sciences*, Mumbai
5. The World Bank Participation Sourcebook, Appendix I, Methods and Tools, Available from URL: <http://www.worldbank.org/wbi/sourcebook/sbhome.htm>
6. Social Impact Assessment Tools and Methods available from URL : http://www.unep.ch/etu/publications/EIA-2ed/EIA_E_top13_hd.pdf
7. Mack J, Lansley, S. *Poor Britain*. London, George Allen and Unwin Ltd. available from URL: <http://www.mande.co.uk/docs/democrat.htm>
8. Understanding Poverty, Overview. Available from URL. http://www.worldbank.org/poverty/health/wbect/health_eg_tno4.pdf.
9. Background Document, unedited draft, 23-01-05 Unedited Working Paper, 14-07-2005
Global health promotion scaling up for 2015 - A brief review of major impacts and developments over the past 20 years and challenges for 2015. Available from URL:http://www.who.int/entity/healthpromotion/conferences/6gchp/hpr_conference_background.pdf
10. Aggarwal OP, Bhasin SK, Sharma AK, Chhabra P, Aggarwal K, Rajoura OP. A new instrument (Scale) for measuring the socio economic status of a family: Preliminary Study. *Indian J Commun Medicine* 30(4) : 10 -12.