

## Abstract

The present study was designed with the objective of determining the prevalence of learning outcome and nutritional disorders and other related risk factors for learning outcome in a year one school population in two MOH areas within the district of Colombo. In order to achieve the objectives, a school based cross sectional study (component 1), a comparative cross sectional study (component 2) and a detailed analysis of high and low performers in the entry competency test (component 3) were done.

Two thousand three hundred and four (2304) subjects were included in the prevalence study, the cohort of children who were born, between February 2002 to end of January 2003. The study sample for component one, included all year one students admitted to all schools in the two study areas.

The Entry Competence Test developed by the National Institute of Education was administered to the study population. Based on their performance, each child was allocated to one of four 'mastery levels' (mastery, near mastery, non mastery 1 and non mastery 2). The mastery level was taken as a proxy to the learning outcome levels.

Of the total group, 19.5% achieved mastery level, 45.9% near mastery level and 24.7% and 10.2% as belonging to the non mastery categories 1 and 2.

The nutritional status of the same study population was assessed using anthropometric parameters. The prevalence of stunting was 13.5%, wasting was 6.4%, and under weight was 12.3%. All three indicators of poor nutritional status showed higher values among boys than girls and were associated with lower levels of learning outcome as assessed by the performance in the Entry Competence Test marks ( $p < 0.05$ ).

All students whose entry competency was assessed were grouped into two categories, one including those who attained non mastery levels 1 and 2 and those belonging to mastery and near mastery levels. A sample of 408 students from each of the two groups

were randomly selected to be included in the comparative cross sectional study (component 2). Factors influencing learning outcome levels were studied using a case control approach .

In addition to the indicators of poor nutritional status, several other factors were shown to have a negative influence on learning outcome. They included: lower levels of education of the mother and the father, occupation of the father (belonging to skilled grades), low monthly house hold income and per-capita income, small family size, being the only child in the family, care taker being a person other than the parent, the presence of medical conditions in the mother during the antenatal period, born before 28 weeks of gestation, birth weight of less than 2500 grammes, having been admitted to the Premature Baby Unit.

Several factors related to the home environment such as availability of books, non availability of television and duration of pre-school education for a longer period ( more than one year) were shown to be factors that influenced a positive impact on learning outcome.

The marks obtained by those included in the comparative cross sectional component were arranged in an ascending order and two sub groups, one including those who had the lowest marks ( poor performers) and another group including those with the highest marks ( high performers) were identified to be included in the component 3 of the study. Due to logistic reasons, the numbers in each sub group had to be limited to 50. Other than the factors that were considered in the comparative cross sectional study, a Hemo-Cue test for haemoglobin level of the child, marks obtained at the end of year one examination and an assessment of dietary intake pattern over a one week period was carried out. Results from this component highlighted the significant differences in the haemoglobin levels between the two sub groups. The pattern of dietary intake did not show much variation except for a lower frequency of consumption of organ meat and red meat among the 'poor performers'.

In addition to the factors shown to have an influence on learning outcome that have already been identified, the duration of pre-school attendance and the level of haemoglobin were also shown to be significant determinants. Also, a positive correlation was found between the Entry Competence Test marks and the end of year one term test marks.

The study enabled identification of several factors that influence learning outcome, many of which are amenable to practical interventions. These include: improvement of nutritional status with special emphasis on anaemia, encouraging parents to enable children to have a good quality pre-school education, facilitating the learning environment in the home and in the school and programmes aimed at reducing pre term deliveries and low birth weight.