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Assessing the Awareness of Lead Hazards in the Greater Burlington Area

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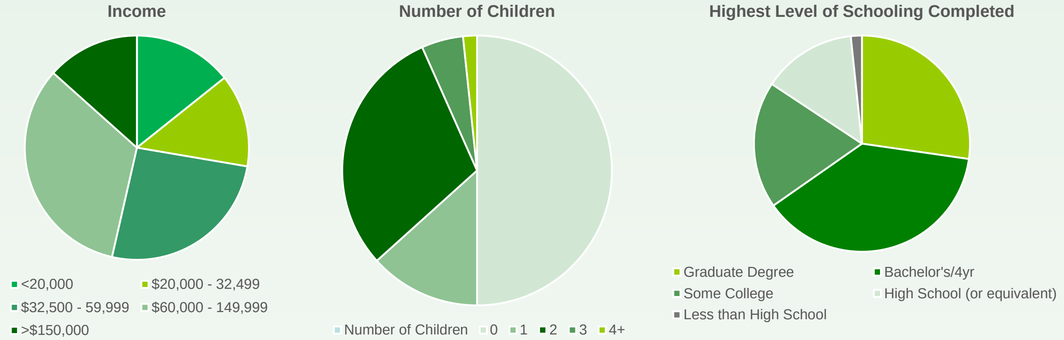
Introduction

- Lead is a common heavy metal found in and around homes built before 1978, which comprises more than 80% of the housing stock in Burlington and Winooski[1]. The Burlington Lead Program renovates homes to reduce lead-based paint hazards, it also focuses on community outreach to educate parents about home lead hazards.
- Lead exposure during infancy and childhood resulting in blood lead levels as low as 5µg/dL, can have a number of deleterious effects on development including lowering IQ, attention deficit, language development, impaired fine and gross motor skills[2-4], but any level of lead can be harmful
- Housing renovations to reduce lead hazards are correlated with a consistent decline in blood lead levels in children over time. Targeted, family-based intervention has also been shown to lead to a reduction in children's blood lead levels[5].
- Our study aims to assess baseline community understanding in Chittenden County of potential lead hazards in and around the home to identify at-risk populations eligible for potential intervention through this program and how to appropriately target communication to these families.

Methods

- A 10 question survey was generated to assess lead based knowledge as it relates to demographical background in Burlington, VT.
- Inclusion criteria for eligible survey takers include residents of the Chittenden County area.
- 123 Chittenden County residents were randomly surveyed at health centers, child care centers and grocery stores within Burlington, VT.
- Scores were treated as continuous variables, demographically grouped and analyzed using non-parametric statistical analysis (Mann-Whitney & Kruskal-Wallis).
- Individual questions were treated as dichotomous variables, demographically grouped and analyzed using chi-squared testing.

Demographics



Results

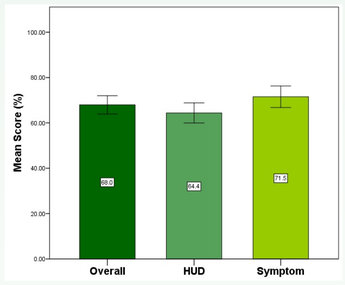


Fig. 1. Lead based knowledge mean score stratified by overall, HUD and symptom scores for 123 administered surveys. Bar graph represents means ± SE.

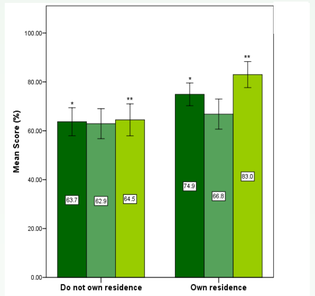


Fig. 3. Lead based knowledge mean score grouped demographically by individuals who own and do not own their residence. Bar graph represents means ± SE. (*) and (**) denotes significant difference between groups for overall and symptom mean score using Mann-Whitney test (p<.05).

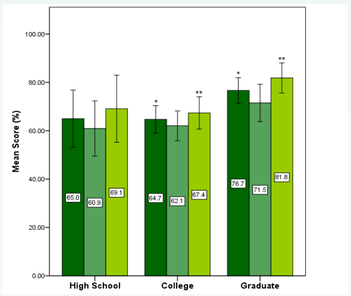


Fig. 4. Lead based knowledge mean score grouped demographically by highest degree earned; high school, college and graduate degree. Bar graph represents means ± SE. (*) and (**) denotes significant difference between groups for overall and symptom mean score using Kruskal-Wallis test (p<.05).

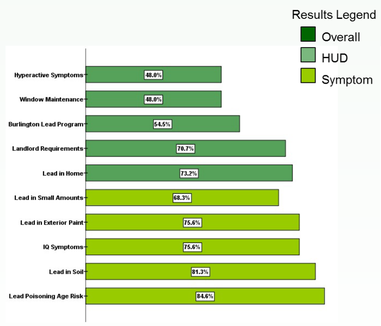


Fig. 2. Performance of lead based knowledge survey stratified by 10 individually assessed questions. Bar graph represents percentage of individuals who correctly answered question.

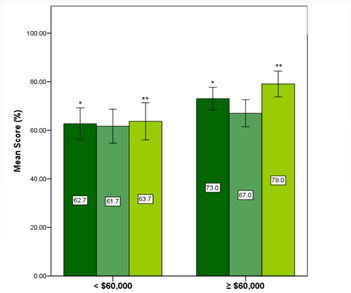


Fig. 5. Lead based knowledge mean score grouped demographically by individuals earning <$60,000 and ≥$60,000 per year. Bar graph represents means ± SE. (*) and (**) denotes significant difference between groups for overall and symptom mean score using Mann-Whitney test (p<.05).

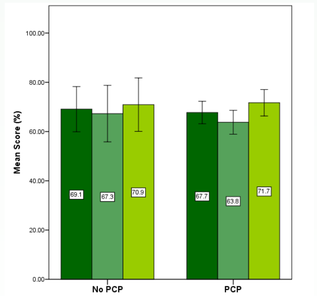


Fig. 6. Lead based knowledge mean score grouped demographically by those who have and do not have a Primary Care Provider (PCP). Bar graph represents means ± SE. No significant difference between groups using Mann-Whitney test.

Discussion

- Overall, the mean score on the surveys was 68%, and some specific questions had an overall lower performance
- 48% of survey participants understood the interaction between ADHD and lead or knew the importance of window maintenance
- The participants who earned less than $60,000 and those who had completed less than a graduate degree scored statistically lower than their higher-earning and graduate-level educated peers on measures of overall lead knowledge and the symptoms of lead poisoning
- 54.5% were aware of the Burlington Lead Program's assistance program, showing there is room for the HUD to improve their community outreach
- Home ownership indicated the greatest difference in performance, as home owners performed significantly better on five of the ten questions, compared to their non-home-owning peers
- Limitations of the study include sampling bias, and small sample size. Future studies should have a larger sample size and should focus on surveying families with children.

Conclusion

- Lesser known lead poisoning symptoms and affordable home interventions that decrease lead exposure should be emphasized to the community regardless of demographic features.
- High risk groups requiring targeted education include those who rent, have lower income and lower education levels.
- Primary Care Providers could play a larger role in providing lead poisoning education to their patients.
- Additional efforts should be made to advertise services offered by the Burlington Lead Program.

References

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