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## Comparison of modes of administration of screens to identify a history of childhood physical abuse in an adolescent and young adult population

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### Abstract

**Background**—Childhood physical abuse is a major public health issue with negative consequences to health and well-being manifested in childhood and adolescence, and persisting into adulthood. Yet much childhood physical abuse is not identified when it occurs and little is known about how to screen for it.

**Methods**—To address this gap, the effectiveness of four modes of administration of screens to identify childhood physical abuse were compared in a sample of 506 adolescents and young adults ages 12 – 24 years seeking general health services at a primary care clinic. Comparisons were made between paper and pencil screen, Audio Computer Assisted Self Interview (ACASI) screen, face to face structured screen (all three utilizing the same measure), and face to face unstructured interview.

**Results**—Overall, 44.5% of the sample disclosed that they had been physically abused. When compared to paper and pencil screen, the odds of reporting physical abuse was 1.5 (95% CI: 0.92, 2.58) and 4.3 (95% CI: 2.49, 7.43) higher among participants using face-to-face structured screen and face-to-face unstructured interview methods, respectively. The face-to-face unstructured interview identified significantly higher reports than the paper and pencil screen.

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**Conclusions**—While the unstructured interview was the most effective mode for screening for childhood physical abuse, additional research is needed to confirm whether this holds true in other health care settings. Further research should examine how a health provider’s training, experience, and comfort level might influence the identification of physical abuse disclosure in primary care settings using face to face unstructured interview.

### Keywords

Screens; Childhood Physical Abuse; Adolescent; Young Adult; Modes of Administration

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### Introduction

Childhood physical abuse is a major public health issue with tremendous emotional and financial burden.<sup>1</sup> Though much abuse goes unreported<sup>2</sup> the number of reported cases among children and adolescents nationally is high: in 2013 there were 3.5 million reports of child maltreatment involving 6.4 million children of which 18% were for physical abuse.<sup>3</sup>

Childhood physical abuse has both short and long-term negative consequences which affect all aspects of functioning throughout the victim’s life course.<sup>2,4,5</sup> In adolescents, the problems associated with abuse include teen pregnancy,<sup>6</sup> high stress, poor self-esteem, cigarette smoking, drug and alcohol abuse,<sup>7,8</sup> and depression and suicidality.<sup>9</sup> These negative effects can be diminished through treatment interventions if the abuse is identified by a health care provider.<sup>1,2,10,11</sup> While most victims do not spontaneously disclose a history of childhood physical abuse, they are likely to disclose if asked in a medical setting as part of a comprehensive health history.<sup>12,13,14</sup> Unfortunately most health care providers do not ask about abuse when there are no obvious signs or symptoms, as is most commonly the case.<sup>15</sup> Though very few studies have focused on understanding why providers do not assess for childhood abuse,<sup>16</sup> there is evidence that they feel ill-prepared and lack the knowledge of effective methods for identification.<sup>18, 17</sup>

A number of modes of administration of screens have been used to identify a history of childhood abuse including paper and pencil questionnaires, interviewer conducted questionnaires, computer assisted questionnaires, and face to face interviews.<sup>18</sup> Each has its merits. The paper and pencil questionnaire is easy to administer but depends on the reader understanding and correctly interpreting questions.<sup>19</sup> In contrast the Audio Computer Assisted Self Interview (ACASI) has an audio component which speaks the questions to the participant and does not require the same level of reading skills.<sup>22</sup> Structured screens, such as the Childhood Maltreatment Interview Schedule-Short Form (CMIS-SF)<sup>20</sup> or the Computer Assisted Maltreatment Inventory (CAMI)<sup>21</sup> use a defined set of questions. In contrast, the face to face unstructured interview allows the give and take of a conversation<sup>22,23</sup> allowing the interviewer to probe. Thus, an experience of physical punishment that a participant might initially define as non-abusive might upon further probing become re-defined as abuse. ACASI, which has not previously been studied in childhood abuse per se, has been found to be more effective than other modes of inquiry in research on highly sensitive issues in adolescents and young adults,<sup>24,,25,26,27,28,29</sup> as it has

also been shown to enhance the participants' sense of privacy and to reduce the influence of social desirability in shaping participants' responses.<sup>30</sup>

Our aim was to compare the effectiveness of four modes of administration of screens – paper and pencil screen, ACASI screen, face to face structured screen, and face to face unstructured interview – to identify a history of childhood physical abuse, during a clinical visit.

## Research Design and Methods

### Study Population

The study sample was recruited from English speaking youth ages 12 to 24 years, seeking general health services, between December 5, 2005 and April 13, 2007, at a New York City primary care clinic specifically designed for young people. A total of 532 young people were screened for history of childhood physical abuse.

### Study Recruitment

Institutional Review Board approval was obtained from the Icahn School of Medicine at Mount Sinai along with a waiver of parental consent to allow consent from adolescents under age 18. A certificate of confidentiality was obtained to protect participants' privacy.

While waiting to see their medical provider, patients were approached by a research assistant who described the project as a confidential study on how to best take a psychosocial history from young people. Patients were told that they could decide against participation at any time without this affecting their care. Those with difficulty understanding the study materials and consent form were not enrolled. No formal sampling or selection protocol was used. Patients who agreed to participate, once consented, were randomized within clinician and non-clinician arms to one of four modes of administration of screens to identify a history of childhood physical abuse. Participants received two movie tickets upon completion of all the study instruments. Safety protocols were put in place to ensure an immediate assessment for any participant who disclosed childhood abuse or suicidality. For those under 18 years who disclosed abuse, child protection reporting protocols were followed.

### Study Randomization

The study was limited by the fact that only one clinician was assigned to conduct the two face-to-face screening groups. Therefore, random allocation was stratified based on clinician's availability. When the clinician was not available, participants were randomized to paper and pencil screen versus ACASI screen and when the clinician was available participants were randomized to face to face structured screen versus face to face unstructured interview.

### Outcome

The study outcome was self-reported history of childhood physical abuse occurring before 17 years of age disclosed during any of the three structured screening methods (paper and pencil, ACASI or face to face structured screens) or a face to face unstructured interview.

The outcome was specified as childhood physical abuse or no childhood physical abuse regardless of the screening method used. For all three structured methods, childhood physical abuse was identified using the Childhood Maltreatment Interview Schedule-Short Form (CMIS-SF) (see Appendix) modified to better fit the speech used by the study population.

### Predictors

Once participants completed the history of childhood abuse using one of the four randomly assigned modes of administration of childhood abuse screens, the participants completed a demographic questionnaire and the Beck Depression Inventory for Primary Care-Fast Screen (BDI-FS)<sup>31</sup> using ACASI.

The primary predictor of interest is the mode of screening to identify a history of childhood physical abuse. The following covariates: age, gender, race, ethnicity, zip code, nativity status (immigration status), last grade completed, school enrollment status, school performance, and living arrangement most of the time within the last year) were considered as potential confounders and were adjusted for in the statistical model.

### Statistical Analysis

The statistical analysis was conducted by Viswanathan Shankar, DrPH. The distribution of socio-demographic variables was presented as frequencies and percentages and bivariate associations were examined using the Pearson chi-square statistics.

Approximately, five percent of the covariates had missing information, thus we modeled the data both as complete case data (n=506) and as a multiply imputed data (532 × 10 dataset). Multiple imputation was done using fully conditional specification methods which is a flexible imputation procedure that models incomplete variables by a set of conditional densities using different regression procedure. Ten imputation datasets were created with 200 burn in iterations under the missing at random (MAR) assumptions.

Multivariable logistic regression models were fitted to examine the effect among the modes of administration and physical abuse status after adjusting for potential confounders for both complete case and multiple imputation data. Potential covariates that were associated with the outcome at 20% level were selected for final models.

All analyses were performed using SAS software 9.4.<sup>32</sup>

### Results

The distribution of participant characteristics by study arms (modes of screen) are presented in table 1. Over half of the participants were age 18 and older (52.2%). Most were female (85.3%), Hispanic/Latino or black (93.3%), and almost a third resided in Harlem (32.7%). The majority were U.S. born (81.6%), currently in school (79.5%) and most had graduated from high school or were still in school at the right grade for their age (88.3%). More than a quarter of participants (27.2%) were found to have depression on the BDI-SF. Sixty-seven (12.9%) of the 520 research participants disclosed suicidal thoughts within the last two

weeks via the BDI-FS. None of these 67 participants were determined to be actively suicidal.

The distribution of characteristics of the total sample was similar across the methods of administration with the exception of age, last grade of education completed and depression. The prevalence of child physical abuse reported under each screening mode is presented in figure 1. Overall, 43.4% of participants disclosed childhood physical abuse. The face to face unstructured interview identified higher percentages of abuse (66.3%), followed by face to face structured screen (45.4%), ACASI (35.5%) and paper and pencil (35.1%) and was significantly different ( $p$  value  $<0.0001$ ).

Childhood physical abuse was not associated with the selected covariates in the study population with the exception of depression (Table 2). Participants who reported childhood physical abuse showed positive association with depression, with 31% depression in those who had physical abuse compared to 23% in those who did not ( $p=0.0380$ ).

We examined the effect of different screening modes to identify child physical abuse, our multivariable model adjusting for potential confounders showed that in both types of face-face interviews, the participants were more likely to report abuse. Specifically in complete case models, the estimated odds of identifying (being reported) child physical abuse is 4.3 times more in the unstructured face-to-face interviews with more probes compared to the paper and pencil screens, as shown in table 3. Similarly, the estimated odds of child physical abuse reported under structured interview was 1.5 times more compared to paper and pencil screen though the effect was not statistically different. Multiple imputation results show similar results to the complete case but the confidence intervals were a bit tighter interval and the structured face to face interview shows a marginal significance.

## Discussion

The prevalence of childhood physical abuse identified by the face to face unstructured interview was four and one half times that of paper and pencil screen, significantly more than all three structured modes of administration. The interviewer who conducted the face to face interviews was a very experienced physician with an expertise in childhood abuse assessment which may account for some of this difference. Another possible contributor is the fact that the face to face unstructured interview allows further probing.

Only one prior study, by DiLillo and colleagues, has compared different modes of administration of screens to identify a history of both childhood physical abuse, comparing three modes (paper and pencil questionnaire, computer assisted survey and face to face structured interview), in a sample of female college students.<sup>33</sup> The DeLillo study reported an overall prevalence of childhood physical abuse of 15.5% but concluded that the mode of administration was unrelated to disclosure of a history of childhood physical abuse ( $X^2=1.1$ ;  $p$  value = 0.58). The present study found prevalence that was more than twice that; 38.6% vs. 15.5%, despite the latter asking about a history of childhood abuse that occurred before age 18 years and the present study using age 17 years as the cutoff. The large difference in prevalence between the two studies when comparing the structured modes of screening is

most likely to be explained by differences between the study populations: the former sampled female students, in a college setting; an overwhelmingly white and middle class group. In contrast, the present study sampled males and females ages 12–24 years, who were 53% Hispanic and 41% non-Hispanic black, recruited from an urban poor population.

The two studies used two different measures to identify physical abuse: The former used the CAMI and the present study used the CMIS-SF, but it is unlikely that the difference in the instruments used in each study accounts for the large difference in prevalence, as both measures utilize detailed and behaviorally specific questions which is considered to be the most effective type of screen.<sup>42,34</sup> The inclusion of the face to face unstructured interview as a fourth mode of administration in the present study is likely to account for the fact that when looking at overall prevalence of childhood physical abuse in this study, we see a prevalence triple that of DiLillo (44.5% vs. 15.5%).

The present study has some limitations. The retrospective, self-report has been found in some history of childhood physical abuse research to be somewhat unreliable due to error in recall resulting in false positives and false negatives.<sup>35</sup> Some researchers suggest that official child protective service reports and self-report used together should be the gold standard<sup>36</sup> but, this is not practical for studies in most settings where official childhood abuse records are not available. More important, a significant proportion – perhaps even a majority – of childhood abuse cases go unreported, so studies using only verified reported cases are likely to undercount.<sup>1,2,24</sup> Indeed, a number of studies have shown that retrospective self-report has shown high stability over time.<sup>37</sup>

Having one sole clinician for the administration of the unstructured interview rather than a number of clinicians with different levels of experience and comfort, an approach taken to reduce the influence of clinician variability on disclosure, limits the generalizability of the findings.

## Conclusion

Although research on how best to identify childhood physical abuse history is in its infancy, this study suggests that face to face methods may offer the most effective ways to screen young people in primary care settings. However, because health care providers are not routinely inquiring about it, we need to better understand the trajectory from suspicion of abuse to the reporting of it in the primary care setting<sup>18,19</sup>. While the present study tells us nothing about how health provider training, experience, competency and comfort level influence the willingness to inquire about abuse, it does underline the need for further lines of research inquiry.

The effectiveness of a given mode of administration of screens to identify childhood abuse should not be confused with its practical application in the clinical setting. Health care providers in primary care practice settings face significant time pressures<sup>38</sup> and therefore, we need to examine whether face to face modes are the most labor intensive and time consuming compared to computer and paper or pencil questionnaires. Furthermore although computer technology is increasingly shaping health care, it is unclear how we will see the

adoption of computer based screening for a range of health issues.<sup>39</sup> Computer based methods for communication between patient and health care provider still present significant challenges for primary care settings where they are not yet seen as practical.<sup>40</sup> Finding the screening method to identify childhood abuse that will prove to be most practical in the primary health care environment, where the use of technology is ever evolving, is a complex issue. Which mode of screening is most practical in the health care setting remains an open question.

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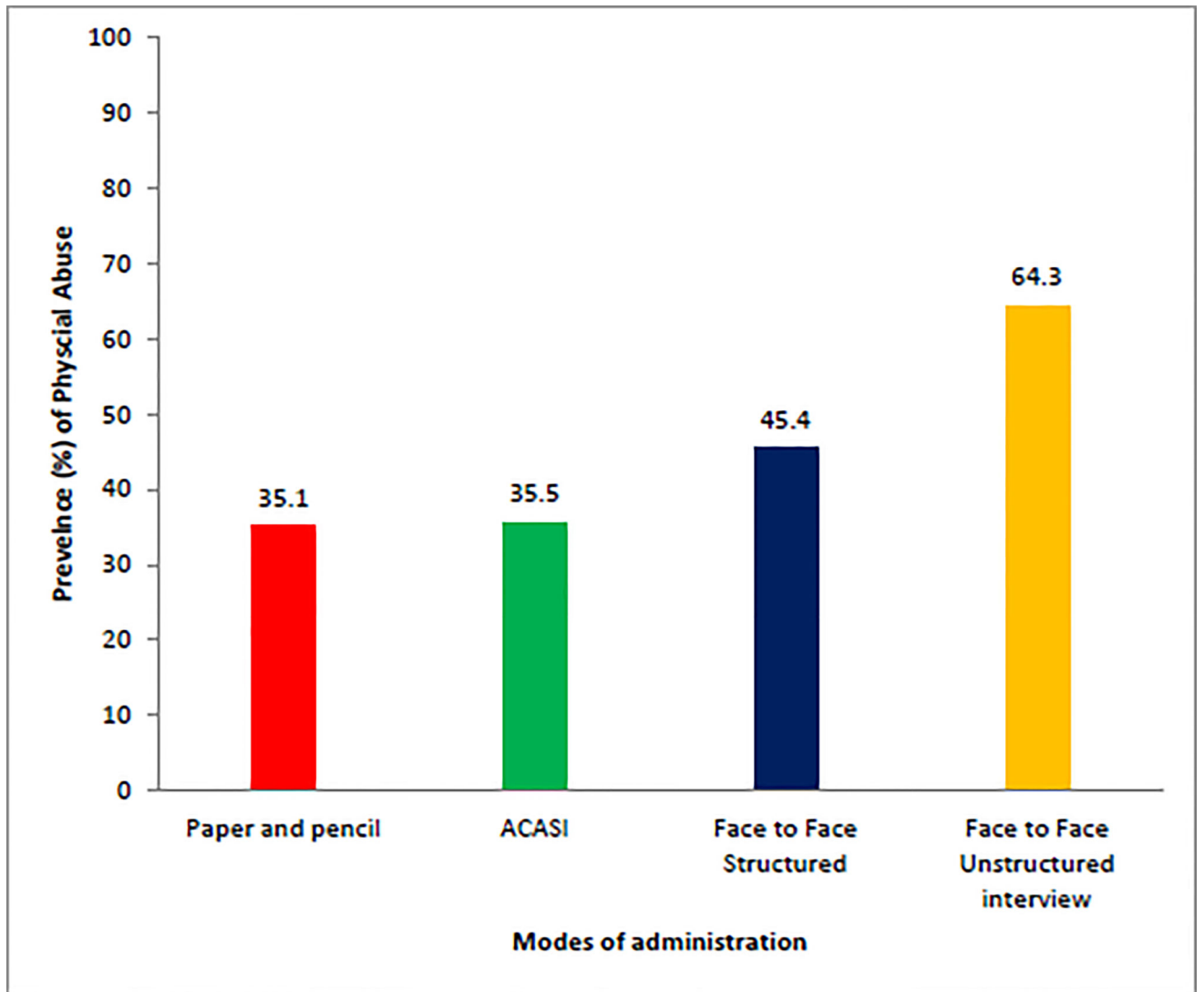


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## Appendix

### Modified Childhood Maltreatment Interview Schedule-Short Form (mCMIS-SF)

<b>Structured interviews:</b>
<b>Before you were 17 years of age</b> (Each question had answer choices of “Yes” or “No):
1. a parent or guardian ever do something to you on purpose (for example, hit or punch or cut you, or push you down) that made you bleed or gave you bruises or scratches
2. Did, or that broke bones or teeth?”
3. Did either of your parents or guardians get so mad at you that they hurt you physically?
4. Did either of your parents or guardians use physical punishment for discipline?
<b>Face to face unstructured interview method:</b>
1. How do your parents or guardians discipline you?
2. Do they ever physically hit you?
3. How do they punish you?
4. Further probing was done depending on the responses to the questions: : having been hit, punched, kicked, or otherwise struck or pushed down; cut, bruised, made to bleed, scratched, having broken bones, broken teeth, or having been hurt physically



**Figure 1.**  
prevalence of child physical abuse reported under each screening mode

Distribution of study participant characteristics of study participants' by modes of administration of screens to identify childhood abuse:

**Table 1**

Characteristics	Methods				P Value
	Paper & Pencil N(%)	ACASI N (%)	Face to Face Structured N(%)	Face to Face Unstructured N(%)	
<b>Demographics</b>					
<b>Age**</b>					
14 and younger	12(6.9)	5(3.6)	12(11.1)	16(14.3)	0.0010
15–17	74 (42.5)	44 (31.9)	39 (36.1)	53 (47.3)	
18 and older	88 (50.6)	89 (64.5)	57 (52.8)	43 (38.4)	
<b>Gender</b>					
Females	151 (86.8)	11((86.2)	97 (89.8)	87 (77.7)	0.2584
Males	23 (13.2)	19 (13.8)	11 (10.2)	25 (22.3)	
<b>Race</b>					
Hispanic/Latin	88 (50.6)	68 (49.3)	62 (57.4)	62 (55.4)	
Black	70 (40.2)	61 (44.2)	42 (38.9)	44 (39.3)	0.5375
Asian or white	16 (9.2)	9 (6.5)	4 (3.7)	6 (5.4)	
<b>Borough</b>					
<i>Bronx</i>					
South Bronx	23 (13.32)	19 (13.8)	15 (13.9)	14 (12.5)	0.2734
Other Bronx	33 (19)	17 (12.3)	13 (12.1)	17 (15.2)	
Brooklyn	13 (7.5)	20 (14.5)	9 (8.3)	5 (4.5)	
<i>Manhattan</i>					
Central and East Harlem	54 (31.0)	51 (36.9)	37 (34.3)	32 (28.6)	
Other Manhattan	35 (20.1)	21 (15.2)	23 (21.3)	27 (24.1)	
Queens	12 (6.9)	7 (5.1)	9 (8.3)	15 (13.4)	
Other	4 (2.3)	3 (2.2)	2 (1.9)	2 (1.8)	
<b>Nativity Status</b>					
US	141 (81.3)	112 (81.2)	82 (75.9)	99(88.4)	0.1214

Methods					
Characteristics	Paper & Pencil N(%)	ACASI N (%)	Face to Face Structured N(%)	Face to Face Unstructured N(%)	P Value
<b>Last grade Completed*</b>	<b>174 (32.7)</b>	<b>138 (25.9)</b>	<b>108 (20.3)</b>	<b>112 (21.1)</b>	
Eight or lower	17 (9.8)	9 (6.5)	16 (14.8)	16 (14.3)	0.0327
Ninth	23 (13.2)	18 (13.0)	10 (9.3)	21 (18.8)	
Tenth	17 (9.8)	17 (12.3)	13 (12.0)	23 (20.5)	
Eleventh	40 (22.9)	22 (15.9)	20 (18.5)	19 (17.0)	
Twelfth	34 (19.5)	29 (21.0)	17 (15.7)	13 (11.6)	
Some/completed college	43 (24.7)	43 (31.6)	32 (29.6)	20 (17.8)	
<b>Education Status</b>					
Dropped out	10 (5.8)	9 (6.5)	8 (7.4)	3 (2.7)	
Currently in k – 12th grade but left behind	10 (5.8)	9 (6.5)	5 (4.6)	8 (7.4)	
Graduated HS or currently in K-12th grade and on track	154 (88.5)	120 (86.9)	95 (87.9)	101 (90.2)	
<b>Living Arrangement for the Last year</b>					
Both parents	42 (24.1)	27 (19.6)	21 (19.4)	27 (24.1)	0.2877
One parent & step	24 (13.8)	14 (10.1)	17 (15.7)	14 (12.5)	
Single parent no other adults	50 (28.7)	46 (33.3)	47 (43.5)	41 (36.6)	
Single parent and other adults	25 (14.4)	20 (14.5)	11 (10.2)	15 (13.4)	
Other family member, foster care, group home	33 (18.9)	31 (22.5)	12 (11.1)	15 (13.4)	
<b>Depression*</b>					
None	116 (66.7)	89 (64.5)	80 (74.1)	88 (78.6)	0.0877*
Any depression	47 (27.0)	44 (31.9)	28 (25.9)	20 (17.9)	
Missing	11 (6.3)	5 (3.6)	0	4 (3.6)	
<b>Suicidal Ideation</b>					
Yes	21 (12.5)	16 (11.8)	18 (16.7)	12 (11.1)	0.6035
No	147 (84.5)	120 (86.9)	90 (83.3)	96 (85.7)	
Missing	6 (3.5)	2 (1.5)	0	4 (3.6)	

based on complete case analysis<sup>\*</sup>

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**Table 2**

Distribution of participant characteristics by physical abuse

Characteristics	No physical abuse 301 (56.6)	Physical abuse 231 (43.4)	P Value *
	N(%)	N(%)	
<b>Mode</b>			
Paper and pencil	113 (37.5)	61(26.4)	<0.0001
ACASI	89 (29.6)	49 (21.2)	
Face to Face Structured	59 (19.6)	49 (21.2)	
Face to Face Unstructured interview	40 (13.2)	72 (31.2)	
<b>Age</b>			
14 and younger	29 (9.6)	16 (6.9)	0.4259
15–17	121 (40.2)	89 (38.5)	
18 and older	151 (50.2)	126 (54.6)	
<b>Gender</b>			
Females	259 (86.1)	199 (86.2)	0.9735
Males	42 (13.9)	32 (13.9)	
<b>Race</b>			
Hispanic/Latin	160 (53.6)	120 (51.9)	0.6133
Black	124 (41.2)	93 (40.3)	
Asian or white	17 (5.7)	18 (7.8))	
<b>Borough</b>			
<i>Bronx</i>			
South Bronx	41 (13.6)	30 (12.9)	0.0788
Other Bronx	44 (14.6)	36 (15.5)	
Brooklyn	24 (7.9)	23 (9.9)	
<i>Manhattan</i>			
Central and East Harlem	111 (36.8)	63 (27.3)	
Other Manhattan	58 (19.3)	48 (20.8)	
Queens	16 (5.3)	27 (11.7)	
Other	7 (2.3)	4 (1.7)	
<b>Nativity Status</b>			
US	253	181 (78.4)	0.09029
<b>Last grade Completed</b>			
Eight or lower	39 (12.9)	19 (8.2)	0.2204
Ninth	42 (13.9)	30 (12.9)	
Tenth	42 (13.9)	28 (12.1)	
Eleventh	54 (17.9)	47 (20.4)	
Twelfth	56 (18.6)	37 (16.0)	

Characteristics	No physical abuse 301 (56.6)	Physical abuse 231 (43.4)	P Value *
	N(%)	N(%)	
Some/completed college	68 (22.6)	70 (30.3)	
<b>Education Status</b>			
Dropped out	18 (5.9)	12 (5.1)	0.7141
Currently in k – 12th grade but left behind	20 (6.6)	12 (5.2)	
Graduated HS or currently in K-12th grade and on track	263 (87.4)	207 (89.6)	
<b>Living Arrangement for the Last year</b>			
Both parents	69 (22.9)	48 (20.8)	0.4885
One parent & step	35 (11.6)	34 (14.7)	
Single parent no other adults	98 (32.6)	86 (37.2)	
Single parent and other adults	43 (14.3)	28 (12.1)	
Other family member, Foster care, group home	56 (18.6)	35 (15.1)	
<b>Depression</b>			
None	218 (72.4)	155 (67.1)	0.0380
Any depression	67 (22.3)	72 (31.3)	
Missing	16 (5.3)	4 (1.7)	
<b>Suicidal Ideation</b>			
Yes	31 (10.3)	36 (15.6)	0.0806
No	261 (86.7)	192 (83.1)	
Missing	9 (2.9)	3 (1.3)	

\* based on complete case analysis

**Table 3**

Adjusted odds ratios, 95% confident intervals and P value of the relationship of mode of administration of screens to identify childhood physical abuse and proportion of childhood abuse: Complete case and Multiple imputation model

Exposure	Complete case model (N=512)	P value	Multiple imputation model (N=532 × 10)	P Value
Mode of Administration				
Paper & Pencil	1.0		1.0	
ACASI	1.02 (0.63, 1.67)	0.9297	0.99 (0.61– 1.61)	0.9781
Structured face to face	1.53 (0.92, 2.58)	0.1029	1.58 (0.95–2.65)	0.0779
Unstructured face to face	4.30 (2.49, 7.43)	<0.0001	4.16 (2.45–7.08)	<0.0001

Final model was adjusted by age, gender, race/ethnicity, depression, living arrangement and last grade completed in both complete case and imputation model.