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Introduction

In the Philippines, one third of the population are adolescents between 10 and 24 years of age.[1] They face several risks: 1 in 12 (8.6%) begin child-rearing before age 19,[2] 1 in 6 (14.6%) smoke tobacco by age 15,[3] 1 in 4 (23.8%) drink alcohol by age 16,[4] and 4 in 5 (80%) experience some form of interpersonal violence by age 24.[5]

The negative effects of these risks cascade throughout an adolescent's lifetime. For instance, teenage pregnancies in the Philippines are associated with higher school dropout rates, more infants with low birth weight, higher rates of maternal and child mortality, and lost economic productivity.[6] Interventions in addressing these risk factors is critical to ensure better quality of life and economic productivity. Many of these behaviors begin around early adolescence, but research on early adolescent behaviors is limited in low- and middle-income country contexts.[7]

Risky and sensitive behaviors such as sexual initiation and tobacco and alcohol use are measured by self-reported questionnaires to ensure that responses are not biased by the presence of an adult. However, some studies globally have indicated that the use of self-administered questionnaires result in inconsistent responses when the same adolescents are asked the same questions in the immediate future.[8-11] However, these studies are at least a generation behind, and little is known about what kinds of adolescents are more likely to inconsistently report behaviors. An ongoing cohort study on adolescents in the Philippines presents a unique opportunity to update current literature by measuring the level of reporting consistency on these behaviors and determine predictors of reporting inconsistency.

Methods

Data Source

This was a secondary analysis of the first 2 waves of the Longitudinal Cohort Study on the Filipino Child (LCSFC), a nationally representative cohort of Filipino adolescents throughout the Sustainable Development Goals (SDGs) implementation period, that is, age 10 in 2015 until age 24 in 2030, to measure the impact of SDG-oriented policies on the country's future economic and health outcomes.[12] Further details on the sampling and data collection methods may be found elsewhere.[13] Wave 1 was conducted from October 2016 to January 2017, with an initial sample of 4952 adolescents. Wave 2 was conducted from February to April 2018, covering 4735 adolescents, an attrition rate of 4.0%. A data-sharing agreement with the United Nations Population Fund (UNFPA) Philippines enabled access to the anonymized data sets.

Each adolescent in the cohort, referred as index child, is asked a series of surveys at the barangay (community), household, and index child level. A unique identifier for every child links data across these 3 levels. The index child answers 2 questionnaires: (1) an interviewer-assisted survey composed of questions on daily activities at home and school, nutrition and health

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status, and knowledge on comprehensive sex education; and (2) a self-administered survey composed of questions on risky and sensitive behaviors. There is also a qualitative component covering a sample of 80 index children, covering vulnerable groups such as indigenous people. This study focuses on the index child self-administered surveys, specifically risky and sensitive behaviors spanning the child's lifetime, that is, ever reported behaviors, asked on both waves. These questions were chosen as they comprehensively cover risks that Filipino adolescents face.[13] This study included all 17 questions, all answerable by "Yes" or "No."

Data Analysis

Prevalence rates of each behavior were calculated as the proportion of "Yes" responses divided by the sample in each wave. Prevalence change between waves was assessed using the McNemar test. To determine how prevalence changed between rounds, retraction and apparent initiation rates were calculated. Retraction was defined as changing responses from "Yes" in Wave 1 to "No" in Wave 2; retraction rate was calculated as the number of retractions divided by prevalent cases in Wave 1. On the other hand, apparent initiation was defined as changing responses from "No" in Wave 1 to "Yes" in Wave 2; apparent initiation rate was calculated as the number of apparent initiations divided by prevalent cases in Wave 2.[9] The index child was also given the option to respond both "yes" and "no" or refuse to respond on most questions. This was assumed as missing data in both cases as it comprised less than 5% of the Wave 2 sample.

Predictors of retraction (1 = retracted, 0 = retained response) were determined using logistic regression, with the sample restricted to prevalent cases in Wave 1 in each of the questions. Predictors were determined a priori from literature sources: sex, domain or major island group (Luzon, Visayas, Mindanao), member of the conditional cash transfer program Pantawid Pamilyang Pilipino Program (4Ps) as a proxy for socioeconomic status, religion (1 = Catholic, 0 = non-Catholic), father's and mother's highest educational attainment (1 = Elementary graduate/Some high school, 2 = High school graduate/Any post–high school education, 0 = No education/Some elementary), father's and mother's ages at Wave 2, both parents being physically present in household during both waves (1 = consistently present, 0 = otherwise), index child's change in perceptions of strictness of their father and mother (1 = from "not strict" in Wave 1 to "strict" in Wave 2, 0 = otherwise), and index child's change in access to the Internet (1 = from no Internet in Wave 1 to with Internet in Wave 2, 0 = otherwise).[8-11,14,15] Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported for each predictor. On both prevalence rates and logistic regression calculations, sampling weights were applied. All analysis was done on Stata 15 (StataCorp, College Station, TX).

Results

Consistency Measures

Table 1 summarizes the consistency measures on all 17 risky and sensitive behaviors, sorted by decreasing retraction rates. Half of the behaviors, or 8 out of 17, reported lower prevalence rates between waves, most notably on watching pornographic movies (−7.7 percentage points [pp], $P < .001$), witnessing physical violence at home (−5.4 pp, $P < .001$), and asking their mother about sex (−4.7 pp, $P < .001$). The decreases are accounted for by higher retraction than apparent initiation rates.

Prevalence rates of 5 behaviors remained the same: holding hands with the opposite sex ($P = .98$), being crushed on by the same sex ($P = .53$), ever kissing the same sex ($P = .46$), alcohol initiation ($P = .81$), and smoking initiation ($P = .37$). All 5 behaviors reported similarly high retraction and apparent initiation rates. More than 50% retracted their responses, with the highest being ever kissing the same sex at 82%.

Only 4 behaviors reported increases, which is the expected result with behavioral questions spanning lifetimes: having a crush on the opposite sex (+14.1 pp, $P < .001$), chatting with a stranger online (+12.0 pp, $P < .001$), being crushed on by the opposite sex (+11.7 pp, $P < .001$), and holding hands with the same sex (+3.1 pp, $P < .001$). Retractions and apparent initiation rates were on average lower than other behaviors, except the behavior on chatting with a stranger online (79.2%). Overall, the median retraction rate across all 17 behaviors was 79.4%.

Predictors of Retraction

Table 2 presents the logistic regression model results on all behaviors. The index child's sex was associated with 5 behaviors. Females were more likely than males to retract alcohol initiation (AOR = 3.05, 95% CI = 1.50-6.23), holding hands with the opposite sex (AOR = 1.86, 95% CI = 1.23-2.81), asking father about sex (AOR = 1.80, 95% CI = 1.07-3.01), and witnessing physical violence at home (AOR = 1.44, 95% CI = 1.05-1.96). Females were less likely than males to retract holding hands with the same sex (AOR = 0.20, 95% CI = 0.14-0.28).

Table 1. Consistency of Self-Reporting Lifetime Risky and Sensitive Behaviors in the Longitudinal Cohort on the Filipino Child, 2016 to 2018, Philippines (n = 4682)[a].

Ever Reported Behaviors From the Self-Administered Questionnaire	Wave 1 Prevalence	Wave 2 Prevalence	McNemar Test *P*	Retraction Rate	Apparent Initiation Rate
Ever gone on a date[b]	7.1%	5.7%	<.001	86.6%	80.5%
Ever did more than a kiss	4.7%	4.0%	<.001	86.5%	82.8%
Ever kissed opposite sex	5.0%	4.8%	.01	86.3%	79.8%
Ever crushed on same sex	8.0%	6.8%	.001	82.3%	77.1%
Tried asking father about sex	14.2%	10.3%	<.001	82.2%	70.3%
Ever kissed same sex	6.9%	7.0%	.46	81.9%	77.4%
Ever watched pornographic movie	17.8%	10.1%	<.001	81.8%	69.4%
Tried smoking cigarettes	4.3%	4.3%	.37	80.2%	74.1%
Tried asking mother about sex	17.2%	12.5%	<.001	79.4%	68.4%
Tried chatting with a stranger online	4.2%	16.2%	<.001	79.2%	95.5%
Ever been crushed on by same sex	7.8%	8.9%	.53	77.8%	76.8%
Tried drinking alcohol	8.9%	9.1%	.81	72.1%	70.9%
Ever witnessed physical violence at home	29.0%	24.4%	<.001	60.5%	52.9%
Ever held hands with opposite sex	20.4%	19.9%	.98	58.8%	60.1%
Ever held hands with same sex	32.9%	36.0%	<.001	41.7%	45.3%
Ever been crushed on by opposite sex	30.8%	42.5%	<.001	37.3%	57.3%
Ever crushed on opposite sex	34.0%	48.1%	<.001	30.5%	51.6%

[a]Prevalence values are weighted proportions. Retraction rate is defined as the proportion of Wave 1 respondents who shifted their answers from "Yes" to "No" between waves; apparent initiation rate is defined as the proportion of Wave 1 respondents who shifted their answers from "No" to "Yes" between waves.

[b]Sample interpretation (using the behavior "ever gone on a date"): 7% of children reported having ever gone on a date during Wave 1. Of those, 86.6% retracted their response in Wave 2. Wave 2 prevalence is 5.7%, 80.5% of which was driven by apparent initiation between Waves 1 and 2.

Change in index child's perception of mother's strictness between waves was associated with 4 behaviors. Those whose mothers were perceived as strict in Wave 2 were more likely to retract chatting with a stranger online (AOR = 8.44, 95% CI = 1.47-48.45), asking mother about sex (AOR = 2.52, 95% CI = 1.39-4.56), and asking father about sex (AOR = 2.48, 95% CI = 1.23-5.00), while less likely to retract alcohol initiation (AOR = 0.36, 95% CI = 0.15-0.88). However, change in index child's perception of father's strictness between waves was negatively associated with retracting chatting with a stranger online (AOR = 0.13, 95% CI = 0.02-0.84).

Being in a 4Ps household was positively associated with retracting crushing on opposite sex (AOR = 1.48, 95% CI = 1.05-2.10) and witnessing physical violence at home (AOR = 1.53, 95% CI = 1.11-2.10). Having both parents physically present in the household consistently between waves was positively associated with retracting kissing the opposite sex (AOR = 7.07, 95% CI = 1.29-38.64). Being Catholic was negatively associated with retracting holding hands with the opposite sex (AOR = 0.55, 95% CI = 0.33-0.93). Finally, change in gaining access to the Internet between waves was positively associated with retracting alcohol initiation (AOR = 2.60, 95% CI = 1.14-5.91).

Discussion

On most of the 17 risky and sensitive behaviors, majority of index children were inconsistent with reporting lifetime behaviors. The retraction rates in this study were higher than previously reported in literature for young adolescents, although retesting intervals in those studies were much shorter. On sexual initiation, a 2000 Jamaican study only had a 9.9% retraction rate,[8] while a 2008 South African study had 46%.[10] On tobacco and alcohol initiation, a 2005 Northern Ireland study found retraction rates of 10% and 7% only, respectively.[11] Finally, a 2009 analysis of the United States Youth Risk Behavior Survey found that the median retraction rate on lifetime behaviors was only 23.7%.[9]

On many behaviors, sex of the index child was a significant predictor of retraction. Females seem to be more likely to retract responses than males, with the exception on same sex behaviors where males seem to be more likely to retract. This is in contrast to other studies where males were seen to be more inconsistent reporters,[8] or sex of the index child was not a significant predictor at all.[10]

Another common predictor across the behaviors was the change in perception of strictness of the mother. Previous studies have suggested an association of

Table 2. Predictors of Retracting Self-Reported Risky and Sensitive Behaviors in the Longitudinal Cohort on the Filipino Child, 2016 to 2018, Philippines, Reported as Adjusted Odds Ratios (AORs).

	Ever Held Hands With Same Sex	Ever Crushed on Opposite Sex	Ever Witnessed Physical Violence at Home	Ever Been Crushed on by Opposite Sex	Ever Held Hands With Opposite Sex	Tried Asking Mother About Sex	Ever Watched Pornographic Movie	Tried Asking Father About Sex	Ever Been Crushed on by Same Sex	Ever Crushed on Same Sex	Tried Drinking Alcohol	Ever Kissed Same Sex	Ever Gone on a Date	Ever Did More Than a Kiss	Ever Kissed Opposite Sex	Tried Smoking Cigarettes	Tried Chatting With a Stranger Online
Wave 1 prevalent cases, n	1150	1088	1033	952	673	652	566	545	303	310	306	291	278	209	198	166	113
Female (ref: male)	0.20***	0.87	1.44*	0.74	1.86**	1.54	1.32	1.80*	0.54	0.57	3.05*	0.55	1.46	0.64	0.91	1.38	0.67
Domain (ref: Luzon)																	
Visayas	1.03	1.35	0.75	1.07	1.13	0.56*	0.90	0.44*	1.08	0.66	1.35	0.45	1.40	0.14	0.20	2.37	1.91
Mindanao	0.99	1.31	0.51**	1.46	1.05	0.87	0.86	0.85	1.20	0.83	0.97	0.52	2.58	0.45	0.16	1.84	1.40
4Ps member	1.11	1.48*	1.53**	1.22	1.32	1.04	1.12	0.89	1.69	0.63	1.76	1.03	0.86	0.56	0.47	1.20	2.00
Catholic	0.85	0.76	0.99	0.74	0.55*	1.10	0.63	1.61	0.71	1.08	0.61	0.75	1.10	1.22	1.23	1.29	0.14
Father's education (ref: No educ/some elem)																	
Elem grad/some HS	1.10	0.87	1.44	1.28	1.17	1.22	1.17	1.17	0.41*	1.68	1.45	0.74	1.50	1.07	0.99	0.70	0.57
HS grad/post-HS	0.85	0.63	0.95	1.13	1.33	1.79	1.33	1.75	0.73	1.30	1.87	0.69	0.88	0.75	0.33	1.03	0.36
Mother's education (ref: No educ/some elem)																	
Elem grad/some HS	0.65	0.76	1.13	0.55	0.96	0.74	1.25	1.18	0.89	0.72	1.01	0.62	0.30	0.50	0.82	0.72	0.54
HS grad/post-HS	0.75	0.65	1.55	0.52	1.02	0.76	0.88	1.49	1.19	0.67	0.78	0.75	1.24	0.70	1.09	1.25	0.60
Father's age at Wave 2	0.99	1.00	0.98	1.04*	1.03	0.98	1.05	0.95*	1.02	0.96	1.00	1.02	1.04	0.99	1.08	1.03	1.07
Mother's age at Wave 2	0.98	0.97	1.02	0.96*	1.00	1.03	0.96	1.08*	1.00	1.06	0.95	1.00	0.99	1.05	0.96	0.93	0.86*
Both parents physically present in household during both waves	1.66	1.75	1.10	1.65	1.28	0.82	1.33	1.20	1.40	3.03	0.42	0.79	0.72	2.40	7.07*	3.58	0.30
Father reported as being strict only at Wave 2	0.73	0.74	0.79	0.79	0.81	0.63	0.93	1.01	1.31	1.19	1.03	0.61	1.06	1.06	0.35	0.98	0.13*
Mother reported as being stricter only at Wave 2	0.85	0.67	0.61	0.66	0.94	2.52**	1.07	2.48*	0.80	1.60	0.36*	1.09	1.04	2.16	0.99	0.74	8.44*
Gained access to Internet only at Wave 2	0.77	1.43	0.82	1.04	1.36	0.87	0.73	1.20	1.20	0.54	2.60*	0.62	1.59	1.60	2.12	1.85	2.60

Abbreviations: n, number of children reporting "Yes" during Wave 1; 4Ps, Pantawid Pamilyang Pilipino Program, the Philippines' conditional cash transfer program; educ, education; elem, elementary (Grade 6 if graduated); HS, high school (Grade 12 or fourth year high school if graduated); post-HS, some college, college graduate, postgraduate, and technical/vocational courses.

*P < .05; **P < .01; ***P < .001.

parent-child relationships and sexual initiation,[16,17] and this study provides further evidence of that. In this study, the mother's relationship seemed to be a better predictor than the father's relationship, which reflects the fact that more index children identified their mother as a primary caregiver than the father.[13]

This study seems to provide evidence against the use of self-administered questionnaires on risky and sensitive behaviors for early adolescents. Aside from long periods between recall, it is also possible that the adolescents did not understand the questions in the first place.[18] Early adolescence is a period marked by many physical, emotional, and social changes—thus, measuring lifetime behaviors during this time period is expected to provide inconsistent results over time. For example, "ever held hands with the same sex" may mean a mother holding a daughter's hand, and not necessarily meant as a romantic gesture toward a fellow female classmate. Furthermore, inconsistencies may reflect more on adolescents' awareness to societal expectations and cultural norms rather than actual behaviors.[19]

The study was limited in exploring associations of certain predictors; therefore, further research is needed to develop a causal model of retraction. Results from this study also do not indicate the true prevalence of these behaviors, which is the goal to develop sound policies addressing adolescent risks. Future rounds of this ongoing cohort study may reconsider the use of these questions. Instead of asking lifetime behaviors, it may be more appropriate to ask 2-week behaviors instead.[9] Further validation of early adolescents' understanding of the questions may also be needed. Other data collection methods should also be considered, such as drawing and photovoice, which may be more engaging and accurate tools, although they may be more expensive to administer.[20]

Conclusion

Majority of Filipino adolescents were inconsistent with their responses on a wide range of risky and sexual behaviors. This study recommends that future rounds of the LCSFC use shorter recall intervals, revalidate question comprehension, or use alternative data collection methods to record risky and sensitive behaviors. Any future research on early adolescents globally should consider the results of this study as they design their methods.

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