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Authors

Din, Hena Naz
Strong, David
Singh-Carlson, Savitri
[et al.](#)

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Association Between Pregnancy Intention and Preconception Health Behaviors

Hena Naz Din, MPH¹, David Strong, PhD^{2,3}, Savitri Singh-Carlson, RN, PhD, FAAN⁴, Heather L. Corliss, MPH, PhD^{1,5}, Sheri J. Hartman, PhD^{2,3}, Hala Madanat, PhD^{1,6,7}, H. Irene Su, MD, MSCE⁸

¹School of Public Health, San Diego State University, San Diego, California

²Herbert Wertheim School of Public Health and Human Longevity Science, University of California San Diego, La Jolla, California

³Moores Cancer Center, University of California San Diego, La Jolla, California

⁴School of Nursing, San Diego State University, San Diego, California

⁵Center for Research on Sexuality and Sexual Health, Institute for Behavioral and Community Health, San Diego State University, San Diego, California

⁶Division of Research & Innovation, San Diego State University, San Diego, California

⁷Institute for Behavioral and Community Health, San Diego State University, San Diego, California

⁸Division of Reproductive Endocrinology and Infertility, University of California San Diego, San Diego, California

Abstract

BACKGROUND: Female adolescent and young adult (AYA) cancer survivors face higher infertility and pregnancy risks than peers with no cancer history. Preconception health behaviors such as physical activity (PA), tobacco smoking, and alcohol intake influence reproductive outcomes. In general populations, pregnancy intention is positively associated with healthy preconception behaviors, but it has not been studied among AYA survivors. The authors hypothesized that higher pregnancy intention would be associated with healthier behaviors, especially among AYA survivors with perceived infertility risk.

METHODS: A cross-sectional analysis was conducted with data collected between 2013 and 2017 from 1071 female AYA survivors aged 18 to 39 years who had completed their primary cancer treatment and enrolled in an ovarian function study. Self-reported intention dimensions

Corresponding Author: Hena Naz Din, MPH, University of California San Diego, 9500 Gilman Dr, La Jolla, CA 92093 (hena.n.din@gmail.com).

AUTHOR CONTRIBUTIONS

Hena Naz Din: Concept, data analysis, interpretation, and manuscript development. **David Strong:** Data analysis, interpretation, and manuscript review. **Savitri Singh-Carlson:** Research design, analysis review, and manuscript review. **Heather L. Corliss:** Research design and manuscript review. **Sheri J. Hartman:** Research design and manuscript review. **Hala Madanat:** Research design and manuscript review. **H. Irene Su:** Concept, interpretation, and manuscript review.

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CONFLICT OF INTEREST DISCLOSURES

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were measured as a pregnancy intention score (PIS) and trying now to become pregnant. Multivariable linear (PA), binary (smoking), and ordinal (alcohol use) logistic regressions were used to estimate associations between intentions and preconception behaviors, with adjustments made for demographic and cancer characteristics. Effect modification by perceived infertility risk was assessed.

RESULTS: The mean PIS was 1.1 (SD, 0.77) on a 0 to 2 scale (2 = high intention), and 8.9% were attempting pregnancy now. A higher PIS was associated with increased PA (β , 0.08; 95% CI, 0.11-1.04), whereas ambivalence in pregnancy intention was associated with lower alcohol consumption (odds ratio, 0.72; 95% CI, 0.55-0.95). Pregnancy intentions were not associated with smoking. Perceived infertility risk strengthened the relationship between PIS and PA ($P < .05$).

CONCLUSIONS: Pregnancy intentions were associated with some healthier preconception behaviors in AYA survivors. Medical professionals caring for AYA survivors may consider pregnancy intention screening to guide conversations on preconception health.

Keywords

adolescent and young adult cancer; alcohol; fertility; physical activity; preconception; pregnancy intention; smoking

INTRODUCTION

Reproductive-age survivors of cancers diagnosed during their adolescent and young adult (AYA) years are a growing group with diverse and complex reproductive needs. An estimated 60% of female AYA survivors report the desire to have children in the future; however, many cancer treatments have adverse effects on fertility and pregnancy health.¹ Female AYA cancer survivors experience a 1.30-fold increase in diagnosed clinical infertility and a 39% decrease in pregnancy rates in comparison with peers with no history of cancer.^{2,3} Cancer survivors are at higher risk of preterm birth (a 1.5- to 2-fold increase), low birth weight (a 2- to 3-fold increase), and pregnancy loss (a 1.4- to 2.8-fold increase) in comparison with pregnant women without prior cancer.⁴ Because of increased risks to fertility after cancer treatment, engaging in healthy preconception behaviors may be particularly important for female AYA survivors.

Preconception health behaviors can affect fertility, pregnancy, and neonatal outcomes, but studies show that AYA survivors engage in risky behaviors.⁵ Healthy preconception behaviors such as engaging in physical activity (PA) at recommended guidelines can be protective against excessive weight gain and gestational diabetes, whereas risky behaviors such as smoking and high alcohol consumption are associated with reduced fertility, a higher likelihood of unintended pregnancies, and adverse neonatal outcomes.⁶⁻⁹ AYA survivors are less physically active, have higher rates of smoking, and drink alcohol at similar rates in comparison with peers without cancer.^{10,11} Poor health behaviors in AYA survivors are concerning because they may adversely affect already increased reproductive risks.

Pregnancy intention is positively related to healthy preconception behaviors in the general population,^{12,13} but this relationship has not been studied in AYA survivors.^{10,11} Health behavior change theories posit that engagement in preconception health behaviors may be

influenced by intention and perceived threats to achieving a healthy pregnancy. Intention is associated with action as per the Rubicon action model, which details the process of intention formation as follows: no intention formed, nonurgent intention, and urgent intention.¹⁴ The progression of intention formation is associated with increasing action.¹⁴ When this is applied to preconception behaviors, dimensions of pregnancy intention such as wanting a child, planning a pregnancy, and trying to become pregnant may lead to different levels of action. *Wanting* is preconception desire to have a child without any specific action outlined.¹⁵ *Planning* includes preconception desire and incorporates some level of intended and real action to initiate or prepare for a pregnancy.^{15,16} *Trying* represents urgent intention and focuses on real action taken to achieve a pregnancy, such as engaging in healthy preconception behaviors.¹⁵ In addition, the health belief model (HBM) construct of perceived susceptibility may moderate the association between pregnancy intention and health behaviors because those who perceive increased infertility risk due to the gonadotoxicity of cancer treatments may be more likely to engage in behaviors that will mitigate risk.^{13,17} Guided by Rubicon's action model and the HBM, the objective of this study was to evaluate the association between pregnancy intention and engagement in PA, smoking, and alcohol use among female AYA survivors. It was hypothesized that higher levels of pregnancy intention would be associated with engagement in healthier preconception behaviors, especially among those with perceived infertility.

MATERIALS AND METHODS

This cross-sectional study used baseline data collected between 2013 and 2017 from the Reproductive Window in Young Adult Cancer Survivors (Window) study, a longitudinal study estimating the trajectory of ovarian function among AYA survivors.¹⁸ Participants were recruited through Californian and Texan cancer registries, social media, and physician referrals. Eligible participants included females who were 18 to 39 years old, had been diagnosed with cancer between the ages of 15 and 39 years, had completed their primary cancer treatment, and had at least 1 ovary. The exclusion criteria were uncontrolled endocrinopathies and multiple cancers or recurrence. The State of California Committee for the Protection of Human Subjects and the Institutional Review Boards at the University of California, San Diego, and the Texas Department of State Health Services approved the Window study. For this analysis, participants who completed baseline surveys and had a uterus were included. All variables were self-reported via an online questionnaire.

Measurements

Pregnancy intention dimensions—Three items captured the dimensions of wanting, planning, and trying; wanting and trying measures came from the US National Survey of Family Growth.¹⁹ On wanting, participants were asked if they would want a baby sometime in the future.¹⁹ The final responses were *want* and *do not want* a child.

On planning, 1 item asked when participants planned on having a baby. To reflect a separation of urgent and nonurgent intentions,¹⁴ responses were collapsed into not planning (*not planning on having a child*), planning now (*already trying or will try in 1 year*), and planning later (*from 1 to >5 years from now*), with *prefer not to answer* excluded.

On trying, 1 item asked participants if they were attempting to become pregnant. Responses included *yes—trying now*, *no—avoiding pregnancy*, and *neither trying nor avoiding pregnancy*. *Neither* represented ambivalent intention.

The wanting and planning scales were summed to create a novel pregnancy intention score (PIS); each item was coded in a ranked manner, and PIS was subjected to Mokken analysis.²⁰ Mokken analysis determines whether items of different measures are scalable and work well together as a comprehensive measure.²⁰ Mokken analysis confirmed that PIS was a robust scale with both a high *h* statistic of 0.85 and no violation of monotonicity.²⁰ The resultant PIS measured pregnancy intention on a 5-point scale from 0 to 2, with 2 representing highest intention. Because PIS was created by the summation of a 2-point scale with a 3-point scale, half-points were used to allow for equal weighting in the combination of the scales. Trying was kept separate as a dimension because when it was combined with the other dimensions of intention, the monotonicity of the scale was violated. For final analyses, pregnancy intention was measured by 2 variables: PIS and trying.

Current smoking behavior—Participants were asked if they currently smoked tobacco, and the final responses were *current smoker* (includes *daily* and *less than daily*) and *nonsmoker*.²¹ *Don't know* responses were excluded from the analysis.

PA—Participants were asked how many days they were physically active in the past 7 days for at least 30 minutes per day; this included PA that increased the heart rate and breathing.

Alcohol consumption—Participants reported the frequency of alcohol intake as the number of occasions any type of alcoholic drink was consumed in the last 12 months. The final categories included nondrinkers (never drank or did not drink in the last 12 months), occasional drinkers (1-11 times in the past year or 1-3 times per month), and heavy drinkers (once per week or more).

Perceived infertility risk—Participants were asked if they felt that their own fertility was greater than, the same as, or less than that of their female peers.²² Responses were collapsed to compare any perception of increased risk with no perception of increased risk. Per the HBM, any increase in risk may mitigate behavior.¹⁷ The final categories were *no increased risk* (included a greater level of fertility or the same level) and *increased risk* (included less fertility or infertility).

Confounders—Because of limited research on preconception behaviors among AYA survivors, the covariates described here were selected on the basis of studies among general populations of women that showed confounding. Demographic covariates included age, race, ethnicity, sexual orientation, education, income, marital status, and health insurance coverage. Respondents ranked their overall general health with 5 responses ranging from *excellent* to *poor*. The body mass index was calculated with self-reported weight and height. Self-reported comorbidities were categorized as cardiovascular/pulmonary, endocrine, psychological, and other comorbidities. Additional covariates identified as potential confounders included parity, cancer type, and consultation with a fertility specialist before, during, or after cancer treatment. Psychosocial factors included stress measured by

the Perceived Stress Scale 10,²³ depression measured by the Patient Health Questionnaire Depression Scale,²⁴ and social support measured by the RAND Institutes Medical Outcomes Study Survey.²⁵

Statistical Analysis

The independent variables were PIS and trying to become pregnant. The outcomes were days of PA in the last week, current smoking behavior, and alcohol consumption in the last year. After a descriptive analysis, bivariable analyses estimated associations between independent variables and outcomes with χ^2 , Fisher exact, and Student *t* tests as appropriate. Covariates closely associated with one another ($p < 0.5$) were reduced to include 1 of the 2 variables in the final model; age at enrollment, stress, and perceived infertility risk were retained in all multivariable models, whereas age at diagnosis, depression, and type of cancer were not. For multivariable analysis, linear regression was used for PA because of its approximately normal distribution, binomial logistic regression was used for smoking, and ordinal logistic regression was used for alcohol consumption. Each model was built from an explanatory model perspective. All covariates were included and then reduced if they were nonsignificant in the model and did not present confounding ($> 10\%$ change in the parameter). Perceived infertility risk was assessed as a moderator in each final parsimonious model to study whether the relationship between pregnancy intention and outcome differed by perceived infertility risk. All analyses were conducted with R Studio (version 1.2.5001).

RESULTS

Sample Characteristics

A total of 1071 female AYA survivors were included (Table 1). The mean ages at study enrollment and at cancer diagnosis were 33.3 years (SD, 4.9 years) and 25.7 years (SD, 5.8 years), respectively. The majority of the participants were non-Hispanic White (60.5%), were married (68.8%), had a college education or more (71.2%), and did not have a child (57.1%). The most common cancers included blood cancer/leukemia (34.9%), breast cancer (22.8%), and skin cancer (18.6%); this was similar to the general AYA population.²⁶ The majority of the participants (63.3%) perceived themselves to be at higher risk of infertility, and only 28% of the participants had ever visited a fertility specialist. The overall mean PIS (SD) was 1.1 (0.77), with the most common response being that participants wanted a child but were planning later (38%; Table 2). Additionally, 8.9% reported that they were trying now to become pregnant, whereas approximately 35% were ambivalent about pregnancy (Table 2). Higher pregnancy intention was seen in participants who were younger, were heterosexual in orientation, were in a partnered relationship, had a higher perceived infertility risk, and had visited a fertility specialist (Supporting Table 1).

Outcomes of Interest

PA—Participants reported a mean of 4.1 days (SD, 2.0 days) of PA in the last 7 days. In unadjusted and adjusted models (Table 3), PIS was not associated with PA, whereas those reporting trying now had higher levels of PA in comparison with participants not trying (adjusted β , 0.08; 95% CI, 0.11-1.04). Higher education, increased body mass index, worse

general health, and moderate stress (compared with no/low stress) were associated with lower PA in both models.

Current smoking behavior—The majority of the participants were not current smokers (93.9%). In unadjusted models (Table 4), a higher PIS was associated with lower odds of smoking, whereas ambivalent intention was associated with higher odds in comparison with those not trying. Neither association remained significant within adjusted models. Higher household income, parity, having health insurance, and more social support were found to be related to higher odds of smoking in both adjusted models.

Alcohol consumption—Half of the participants reported occasional alcohol consumption in the past year (50.9%), with 38.6% reporting heavy consumption. In unadjusted models (Table 5), a higher PIS was associated with higher odds of heavier consumption, whereas ambivalent intention was related to lower odds in comparison with those not trying. In adjusted models, only participants reporting ambivalent intention had significantly lower odds of heavy alcohol consumption in comparison with those not trying to be pregnant (odds ratio, 0.72; 95% CI, 0.55-0.95). Non-White race, parity, and worse general health were associated with lower odds of heavy alcohol consumption in both models. Higher education in both models and being employed in the trying model were associated with heavier alcohol consumption.

Perceived Infertility as a Moderator

Perceived infertility moderated the relationship between PIS and PA but not between trying and PA (Fig. 1). Among participants who perceived infertility risk, the relationship between PIS and PA was positive, whereas among participants who did not perceive an infertility risk, the relationship between PIS and PA was negative ($P < .05$). Perceived infertility was not an effect modifier of the relationships between pregnancy intention (PIS or trying) and tobacco smoking or alcohol consumption.

DISCUSSION

For female AYA cancer survivors, navigating fertility and pregnancy after cancer is complex. With higher infertility and perinatal risks, AYA survivors may benefit from pre-conception behaviors that benefit fertility and pregnancy. In general populations, pregnancy intention is associated with more PA and less smoking and alcohol use. In our cohort of AYA survivors, urgent pregnancy intention (trying now) was associated with more PA, whereas ambivalent intention was associated with lower alcohol consumption. Taken together, pregnancy intention dimensions were associated with some healthy preconception behaviors and could identify female AYA survivors who may benefit from preconception health education and interventions to change these behaviors.

Compared with PIS, trying was hypothesized to be associated with greater action based on the Rubicon action model. Indeed, we observed that survivors who reported trying to become pregnant now reported more PA in comparison with those not trying or having ambivalent intention. Furthermore, aligned with the HBM, perceived susceptibility affected this relationship: AYA survivors who had higher pregnancy intention and believed that they

were at risk of infertility engaged in more PA than women who did not perceive fertility loss. These results are consistent with previous studies in general populations showing that pregnancy intention and PA are significantly associated, and perceived risk (to conceiving or achieving a healthy pregnancy) strengthens this relationship.^{27,28} Our findings support the idea that survivors' engagement in PA is influenced by urgent intention.

Measured pregnancy intentions were not associated with smoking, and only ambivalent intention was significantly associated with decreased alcohol use. One reason may be that smoking and alcohol consumption are often the last behaviors to change for many women in both intended and unintended pregnancies,^{29,30} and they mostly change after a pregnancy is recognized; thus, this does not affect preconception behavior. Interestingly, a higher PIS trended toward increased alcohol consumption, but this was not significant, whereas trying followed the expected direction of association. This may be an indicator that PIS is not sufficient to capture urgent intention in comparison with trying, especially among behaviors that are shown to be difficult to change or are more likely to change when a pregnancy is realized. Although trying now was not significant after model adjustment (most likely because of low power), its direction did indicate that it was protective of higher alcohol consumption. A limiting factor was relating pregnancy intention to alcohol intake behavior over the prior year rather than a more narrow time frame. Nonetheless, the prevalence of heavy drinking was high in this sample (38.6%) in comparison with national data on AYA survivors, which showed that ~14% reported heavy drinking.³¹ It is concerning that a large proportion of AYA survivors with increased pregnancy intention were heavy drinkers within a sensitive period of preconception. Providers should screen for problematic alcohol use among AYA survivors because this may compound neonate risk if an unintended pregnancy is discovered.

A significant proportion of the cohort expressed ambivalent intention, which was measured as neither trying nor preventing pregnancy. Ambivalent intention represents some level of desire to become pregnant without invoking urgent actions. Interestingly, ambivalent intention was associated with lower alcohol consumption and a nonsignificant increase in current smoking. Only 2 prior studies measured ambivalent pregnancy intention in studying preconception behavior. Lundsberg et al⁷ found that in a sample of healthy pregnant women, ambivalence toward a current pregnancy was associated with greater preconception alcohol intake and smoking. In contrast, the 2004 Behavior Risk Factor Surveillance System data showed no association between ambivalent intention and smoking or alcohol intake.³² Although replicative studies can clarify these relationships, we show that ambivalent pregnancy intention is a distinct category with specific health behavior risks. Clinically, providers may consider screening AYA survivors regarding their pregnancy intentions, including ambivalent intention, and tailoring preconception health counseling accordingly.

A strength of this study included the evaluation of pregnancy intention before conception, which is ideal in the context of preconception behaviors. Most studies evaluate intention retrospectively after pregnancy or birth, and this increases recall bias as a woman comes to terms with a pregnancy, whether intended or unintended.³³ This study evaluated multiple dimensions of pregnancy intention by using measures from the longstanding National

Survey for Family Growth and included a measure of ambivalence; however, the absence of attitude toward pregnancy was a limitation. This dimension asks if participants have a positive, negative, or ambivalent attitude when thinking of becoming pregnant.¹⁶ Attitude would have made our measure of pregnancy intention more comprehensive by elaborating on the depth of ambivalence toward pregnancy. Although the distribution of cancer types and psychosocial characteristics of this sample were representative of the larger AYA population, the low prevalence of smoking may reflect self-selection of healthy participants who enrolled in a study on ovarian function.^{26,34} An AYA survivor's knowledge of infertility risks was not directly measured, and this limited our understanding of how knowledge affects the perception of infertility, pregnancy intentions, and health behaviors. Other limitations included an absence of matched participants with no history of cancer for comparison and the limited scope of assessed preconception health behaviors. Additional preconception behaviors such as chronic disease management may be particularly important for AYA survivors, who often have comorbidities and would benefit from guidance on behaviors or actions for successful management.

Taken together, the study furthers our understanding of the association between pregnancy intentions and preconception behaviors among reproductive-age female AYA cancer survivors. The results of this study support the idea that screening for pregnancy intention can help providers to identify AYA survivors "susceptible" to health behavior change and to guide conversations on preconception health. AYA survivors are interested in receiving education and guidance about healthy behaviors; however, a majority report a lack of communication from providers.³⁵ Providers caring for AYA survivors may screen for pregnancy intention to guide education and conversations on preconception behaviors even among women reporting ambivalent intention.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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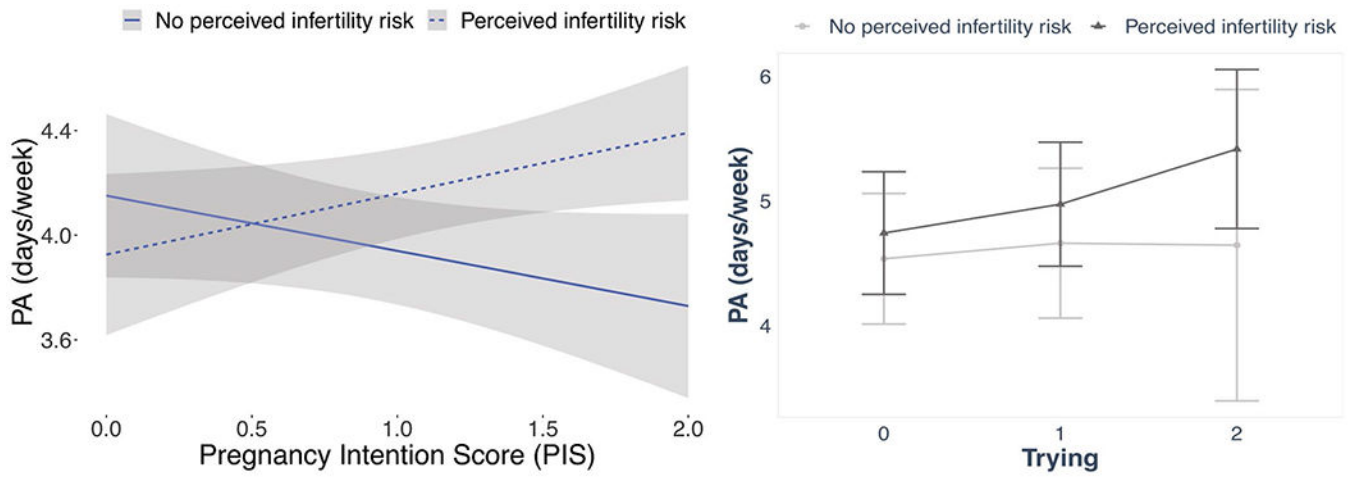


Figure 1. Effect modification by perceived infertility risk: (*Left*) predicted PA and 95% CIs by pregnancy intention score (stratified by perceived infertility risk) and (*Right*) mean PA and SDs by trying dimension (stratified by perceived infertility risk). PA indicates physical activity.

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TABLE 1.

Demographic and Cancer Characteristics of Female Adolescent and Young Adult Survivors at the Baseline, 2013-2017

Covariate^a	Baseline (n = 1071)
Age at questionnaire, mean (SD), y	33.3 (4.9)
Age at cancer diagnosis, mean (SD), y	25.7 (5.8)
Race	
White	776 (74.3)
Black	30 (2.9)
Asian/Native Hawaiian/Native Alaskan/Native Indian	76 (7.3)
Mixed/other race	163 (15.6)
Hispanic ethnicity	265 (25.2)
Heterosexual	992 (92.6)
Married/living with partner	737 (68.8)
College education	763 (71.2)
Employed	815 (76.1)
\$51,000 household income	719 (67.1)
1 parity	459 (42.9)
Health insurance	1025 (95.7)
Body mass index	
<18.5 kg/m ²	34 (3.2)
18.5-24.9 kg/m ²	457 (42.7)
25-29.9 kg/m ²	244 (22.8)
30 kg/m ²	302 (28.2)
General health	
Excellent	100 (9.3)
Very good	410 (38.3)
Good	429 (40.1)
Fair	115 (10.7)
Poor	14 (1.3)
Cardiovascular/pulmonary comorbidities	165 (15.7)
Endocrinological comorbidities	208 (19.8)
Psychological comorbidities	292 (27.8)
Other comorbidities	340 (32.4)
Stress	
No/low stress	391 (36.5)
Moderate stress	596 (55.6)
High stress	84 (7.8)
Depression	
No significant depression (0-4)	512 (47.8)
Mild (5-9)	295 (27.5)
Moderate (10-14)	158 (15.8)

Covariate ^a	Baseline (n = 1071)
Severe (15-24)	95 (8.9)
Social support, mean (SD)	4.2 (0.9)
Cancer type	
Breast	244 (22.8)
Blood/leukemia/lymphoma	374 (34.9)
Thyroid	120 (11.2)
Reproductive (cervix, uterus, ovary)	28 (2.6)
Gastrointestinal	74 (6.9)
Bone/soft tissue	32 (3.0)
Skin	199 (18.6)
Increased perceived infertility risk	678 (63.3)
Visited a fertility specialist ^b	294 (28.0)

^aVariables are presented as No. (%) unless otherwise indicated.

^bBefore, during, or after treatment.

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TABLE 2.

Distribution of Pregnancy Intention Dimensions Among Female Adolescent and Young Adult Survivors, 2013-2017

Covariate	Total Cohort (n = 1071), No. (%)
Pregnancy intention score (corresponding categories of want and planning dimensions)	
0 (don't want child/not planning pregnancy)	315 (30.7)
0.5 (don't want child/planning later)	27 (2.6)
1 (want child/not planning pregnancy)	100 (9.8)
1.5 (want child/planning later)	394 (38.4)
2 (want child/planning now)	189 (18.4)
Trying	
Not trying	605 (56.5)
Neither (ambivalent)	371 (34.6)
Trying now	95 (8.9)

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Unadjusted and Adjusted Models of the Associations of PIS With PA and Trying to Become Pregnant With PA

TABLE 3.

Covariate	Unadjusted			PIS			Trying		
	β (95% CI)	P	P	Adjusted β (95% CI)	P	P	Adjusted β (95% CI)	P	P
PIS ^a	0.03 (-0.10 to 0.24)	.33	0.05 (-0.05 to 0.30)	.18	—	—	—	—	—
Trying to become pregnant									
Not trying	Reference	—	—	—	—	—	Reference	—	—
Neither trying nor avoiding	0.04 (3.80 to 4.11)	.22	—	—	—	—	0.05 (-0.09 to 0.48)	.19	—
Trying now	0.09 (0.17 to 1.03)	.01	—	—	—	—	0.08 (0.11 to 1.04)	.01	—
Race									
White	Reference	—	Reference	—	—	—	Reference	—	—
Black	-0.04 (-1.18 to 0.27)	.22	-0.03 (-1.2 to 0.30)	.24	—	—	-0.03 (-1.08 to 0.41)	.37	—
Asian/Native Hawaiian/Native Alaskan/Native Indian	-0.05 (-0.83 to 0.10)	.13	-0.06 (-1.04 to 0.01)	.05	—	—	-0.06 (-0.98 to 0.03)	.07	—
Mixed/other race	-0.05 (-0.62 to 0.05)	.09	-0.06 (-0.75 to 0.09)	.13	—	—	-0.06 (-0.74 to 0.10)	.14	—
Ethnicity									
Non-Hispanic	Reference	—	Reference	—	—	—	Reference	—	—
Hispanic	-0.04 (-0.45 to 0.11)	.24	-0.01 (-0.43 to 0.30)	.71	—	—	-0.03 (-0.48 to 0.23)	.50	—
Age	0.03 (-0.01 to 0.04)	.35	0.07 (-0.001 to 0.06)	.06	—	—	—	—	—
Sexual orientation									
Heterosexual	Reference	—	—	—	—	—	Reference	—	—
Homosexual/other	-0.02 (-0.68 to 0.32)	.49	—	—	—	—	-0.02 (-0.70 to 0.36)	.53	—
Education									
<College	Reference	—	Reference	—	—	—	Reference	—	—
College	-0.05 (-0.51 to 0.2)	.08	-0.12 (-0.85 to -0.21)	.001	—	—	-0.12 (-0.85 to -0.22)	.001	—
Employment									
Unemployed	Reference	—	—	—	—	—	Reference	—	—
Employed	0.01 (-0.22 to 0.35)	.65	—	—	—	—	0.02 (-0.24 to 0.40)	.63	—
Household income									
<\$1,000	Reference	—	Reference	—	—	—	Reference	—	—
\$1,000	0.02 (-0.21 to 0.34)	.64	-0.02 (-0.42 to 0.22)	.54	—	—	-0.01 (-0.35 to 0.28)	.82	—
Parity									

Covariate	PIS			Trying		
	Unadjusted β (95% CI)	P	Adjusted β (95% CI)	Adjusted β (95% CI)	P	P
None	Reference	—	Reference	Reference	—	—
1	-0.01 (-0.29 to 0.20)	.71	—	-0.01 (-0.31 to 0.24)	—	.82
Body mass index ^a	-0.13 (-0.05 to -0.02)	.001	-0.11 (-0.05 to -0.01)	-0.12 (-0.05 to -0.01)	.004	.002
General health ^a	-0.19 (-0.59 to -0.31)	.01	-0.15 (-0.54 to -0.18)	-0.14 (-0.51 to -0.15)	.001	.001
Stress						
No/low stress	Reference	—	Reference	Reference	—	—
Moderate	-0.10 (-0.66 to -0.15)	.002	-0.08 (-0.58 to -0.02)	-0.07 (-0.58 to -0.01)	.03	.04
High	-0.08 (-1.03 to -0.10)	.02	-0.02 (-0.71 to 0.35)	-0.03 (-0.74 to 0.35)	.51	.49
Social support	0.08 (0.05 to 0.32)	.01	—	0.03 (-0.09 to 0.22)	—	.44
Perceived infertility risk						
No increased risk	Reference	—	Reference	Reference	—	—
Increased risk	0.05 (-0.03 to 0.47)	.08	0.07 (0.02 to 0.57)	0.06 (-0.01 to 0.55)	.03	.06

Abbreviations: PA, physical activity; PIS, pregnancy intention score.

^aVariables were kept continuous in the analysis.

TABLE 4. Unadjusted and Adjusted Models of the Associations of PIS With Smoking and Trying to Become Pregnant With Smoking

Covariate	Unadjusted			PIS			Trying		
	OR (95% CI)	P	P	Adjusted OR (95% CI)	P	P	Adjusted OR (95% CI)	P	P
PIS ^a	0.68 (0.50-0.94)	.02	.11	0.73 (0.50-1.07)	.11	—	—	—	—
Trying to become pregnant									
Not trying	Reference	—	—	—	—	—	Reference	—	—
Neither trying nor avoiding	2.12 (1.26-3.55)	.005	—	—	—	—	1.72 (0.94-3.14)	.08	—
Trying now	0.46 (0.11-1.96)	.29	—	—	—	—	0.76 (0.19-.3)	.69	—
Race									
White	Reference	—	—	Reference	—	—	Reference	—	—
Black	1.15(0.27-4.98)	.85	.47	0.59 (0.14-2.48)	.47	.47	0.51 (0.12-2.06)	.34	.34
Asian/Native Hawaiian/Native Alaskan/Native Indian	0.91 (0.32-2.6)	.86	.28	1.81 (0.62-5.3)	.28	.28	1.33 (0.46-3.86)	.60	.60
Mixed/other race	0.95 (0.46-1.99)	.90	.63	0.79 (0.31-2.04)	.63	.63	0.82 (0.32-2.11)	.68	.68
Ethnicity									
Non-Hispanic	Reference	—	—	Reference	—	—	Reference	—	—
Hispanic	1.13 (0.64-2.01)	.67	.19	0.58 (0.25-1.31)	.19	.19	0.51 (0.22-1.17)	.11	.11
Education									
<College	Reference	—	—	—	—	—	Reference	—	—
College	0.35 (0.21-0.58)	.001	—	—	—	—	0.61 (0.33-1.14)	.12	.12
Household income									
<\$1,000	Reference	—	—	Reference	—	—	Reference	—	—
\$1,000	0.33 (0.19-0.56)	.001	.001	0.30 (0.16-0.55)	.001	.001	0.37 (0.20-0.70)	.002	.002
Parity									
None	Reference	—	—	Reference	—	—	Reference	—	—
1	1.90 (1.14-3.17)	.01	.01	2.18 (1.17-4.05)	.01	.01	2.05 (1.11-3.78)	.02	.02
Health insurance									
No	Reference	—	—	Reference	—	—	Reference	—	—
Yes	0.32 (0.14-0.75)	.01	.01	0.27 (0.1-0.7)	.01	.01	0.33 (0.13-0.84)	.02	.02
Social support									
Perceived infertility risk	0.57 (0.45-0.72)	.001	.001	0.61 (0.47-0.80)	.001	.001	0.63 (0.48-0.82)	.001	.001

Covariate	PIS			Trying		
	Unadjusted OR (95% CI)	P	Adjusted OR (95% CI)	Reference	Adjusted OR (95% CI)	P
No increased risk				Reference		
Increased risk	1.04 (0.62-1.76)	.88	1.12 (0.61-2.07)	1.00 (0.53-1.87)	1.00 (0.53-1.87)	.99

Abbreviations: OR, odds ratio; PIS, pregnancy intention score.

^aVariables were kept continuous in the analysis.

Unadjusted and Adjusted Models of the Associations of PIS With Alcohol Consumption and Trying to Become Pregnant With Alcohol Consumption

TABLE 5.

Covariate	Unadjusted			PIS			Trying		
	OR (95% CI)	P		Adjusted OR (95% CI)	P		Adjusted OR (95% CI)	P	
PIS ^a	1.20 (1.03-1.40)	.02		1.12 (0.95-1.33)	.18		—	—	—
Trying to become pregnant									
Not trying	Reference			—	—		Reference		
Neither trying nor avoiding	0.65 (0.51-0.84)	.001		—	—		0.72 (0.55-0.95)	.02	
Trying now	0.82 (0.55-1.24)	.36		—	—		0.79 (0.5-1.22)	.28	
Race									
White	Reference			Reference			Reference		
Black	0.70 (0.34-1.44)	.33		0.75 (0.35-1.59)	.45		0.70 (0.34-1.46)	.35	
Asian/Native Hawaiian/Native Alaskan/Native Indian	0.49 (0.31-0.77)	.002		0.37 (0.22-0.61)	.001		0.47 (0.29-0.76)	.002	
Mixed/other race	0.67 (0.48-0.92)	.01		0.91 (0.62-1.34)	.63		0.95 (0.64-1.39)	.78	
Ethnicity									
Non-Hispanic	Reference			Reference			Reference		
Hispanic	0.58 (0.44-0.76)	.001		0.77 (0.55-1.09)	.14		0.75 (0.54-1.05)	.09	
Education									
<College	Reference			Reference			Reference		
College	2.12 (1.64-2.76)	.001		1.72 (1.28-2.31)	.001		1.52 (1.13-2.05)	.01	
Employment									
Unemployed	Reference			—	—		Reference		
Employed	1.98 (1.49-2.62)	.001		—	—		1.62 (1.21-2.19)	.001	
Parity									
None	Reference			Reference			Reference		
1	0.61 (0.48-0.78)	.001		0.62 (0.47-0.81)	.001		0.62 (0.48-1.18)	.001	
General health									
Excellent	0.68 (0.59-0.78)	.001		0.70 (0.60-0.82)	.001		Reference		
Very good	—	—		—	—		0.75 (0.48-1.18)	.21	
Good	—	—		—	—		0.53 (0.34-0.84)	.01	
Fair	—	—		—	—		0.46 (0.26-0.8)	.01	

Covariate	PIS			Trying		
	Unadjusted OR (95% CI)	P	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	P	Adjusted OR (95% CI)
Poor	—	—	0.30 (0.1-0.92)	—	—	—
Perceived infertility risk						
No increased risk	Reference		Reference	Reference		Reference
Increased risk	1.12 (0.88-1.42)	.36	1.16(0.89-1.51)	1.18 (0.90-1.55)	.29	1.18 (0.90-1.55)

Abbreviations: OR, odds ratio; PIS, pregnancy intention score.

^aVariables were kept continuous in the analysis.