Predictors of Pregnancy Disclosure in National Collegiate Athletic Association Division III Athletes

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Context: Pregnant athletes cannot receive proper care if they choose to conceal their pregnancy. Unfortunately, many factors may lead an athlete to conceal. Whereas the extant qualitative literature suggests scholarship and sponsorship are prominent factors in the decision to disclose, this research is limited to elite athletes.

Objective: To quantitatively examine predictors of pregnancy disclosure beyond scholarship and sponsorship in National Collegiate Athletic Association Division III college athletes.

Design: Cross-sectional study. **Setting:** Midwestern United States.

Participants or Other Participants: Athletes on Division III women's sports teams (N = 127).

Main Outcome Measure(s): Confidence in the athletic trainer (AT), perceived training and performance changes, athletic identity, and athletic identity during pregnancy. Two separate multiple regression analyses were conducted with the 4 predictors and 2 outcomes: likelihood to disclose and time to disclosure.

Results: Confidence in the AT and athletic identity during pregnancy were significant predictors in both models, whereas the variable of perceived training and performance changes was only significant in the likelihood to disclose model. Athletic identity was not a significant predictor in either model. Results suggest Division III athletes believe they would be more likely to disclose their pregnancy and may disclose sooner if they feel that their AT can properly manage their physical, emotional, and social wellness during the pregnancy. Additionally, disclosure is promoted if they believe they will still be viewed as athletes by themselves and the people around them.

Conclusions: These findings emphasize the importance of the role of the AT, with implications that formal education of ATs should include the holistic support of the pregnant athlete.

Key Words: trust, concealment, sport motherhood, athletic trainers

Key Points

- Athletes generally see exercise as safe during pregnancy.
- Disclosure of pregnancy is more likely to happen, and to occur sooner, if the athlete is confident the athletic trainer can facilitate care.
- Disclosure of pregnancy is more likely to happen, and to occur sooner, if the athlete believes the people around them will still perceive them as an athlete while pregnant.

he 2020 Commission on Accreditation of Athletic Training Education (CAATE) accreditation standards require students to receive education on how to formulate a diagnosis and plan of care for many body systems, including the reproductive system. Whether this includes pregnancy is unclear, but a recent survey found that 15.5% of high school athletic trainers (ATs) have encountered and managed a pregnant adolescent athlete.² Coupled with crude birth rates ranging from 3.2% to 6.6% for mothers 18 to 24 years, it is possible for an AT working in a collegiate setting to need to manage a pregnant athlete. While exercise during pregnancy is generally considered safe, the safety of the mother and fetus could be at risk if improperly managed. A prominent example is Olympian Allyson Felix, who developed pre-eclampsia and delivered her daughter via caesarean section 7 weeks premature. 4 Her daughter then spent a month in the neonatal intensive care unit. Fortunately, they both survived, and Felix returned to her elite performance level.

While Felix's story has a happy ending, it is a harrowing tale of the dangers of poor management of the pregnant athlete. Felix, for example, concealed her pregnancy to avoid losing her Nike sponsorship.⁴ This is not the only reason pregnancy might be concealed, but numerous serious risks exist for a fetus who does not receive proper antenatal care.⁵ It is therefore important for athletes to disclose their pregnancy to their health care team for the sake of the mother and child. Despite this, some athletes would still choose to conceal their pregnancy.

Qualitative researchers of elite performers have explored reasons why athletes would choose to disclose or conceal their pregnancy. A common influence in elite athletes' decisions to disclose or conceal their pregnancy is related to the financial impact. Some collegiate athletes can afford to attend college due to the support an athletic scholarship provides. Title IX of the Education Amendments of 1972 is a civil rights law that protects people from discrimination based on sex in education programs or activities that receive federal financial assistance. According to this law, pregnant athletes should be granted a leave of absence and provided the opportunity to return to the same status upon return as they had when the leave began. Researchers have suggested certain aspects of athletic performance can be maintained while pregnant, and most athletes feel that their performance is the same or better

after becoming mothers.^{7,8} Despite this, institutions in the past have been found to violate Title IX laws, resulting in a pregnant athlete losing an athletic scholarship and the ability to attend college.⁹ Additionally, elite athletes who receive compensation through sponsorship have chosen to conceal their pregnancy due to fear of a pay reduction.⁹

Finances are an important factor for elite athletes, and this population is the primary focus of most research on pregnancy in competitive sport. However, this research does not represent the greater athlete population, such as the 78 773 Division III female athletes, many of whom do not receive athletic scholarships or sponsorship. Therefore, other influences should receive greater consideration. Variables which have received some empirical support include confidence in the AT, perceived training and performance changes, and athletic identity.

The latest *Board of Certification Practice Analysis* includes the role of ATs in promoting health literacy, which has the goal of empowering patients to take an active role in their own health and wellness. ¹¹ Pregnancy disclosure could be the first step in the athlete taking an active role in safe sport participation, but patient trust is pivotal for disclosure of personal information to a provider. ¹² Patients are more likely to disclose information if they believe their provider can manage their health while also maintaining their privacy. Such privacy may be especially important in relation to pregnancy. The AT may be able to gain this trust through regular interaction and rapport building with their patients. Therefore, a relationship with and confidence in the AT to manage the pregnancy may predict the likelihood of the athlete disclosing pregnancy.

Athletes may not be aware of how pregnancy will affect their training and performance. According to the National Collegiate Athletic Association (NCAA), pregnant athletes are generally safe to continue contact sports before 14 weeks, after which participation can still be maintained under proper medical supervision. ¹³ After birth, training can typically begin after 6 weeks. This scaling back on training can impact performance, which could have implications for previously described financial income as well as placement on the team. ¹⁴ Thus, an athlete may conceal her pregnancy to continue her training and performance levels.

At the intercollegiate performance level, it is common for athletes to commit to an athlete role without consideration of other possible identities. 15 This unidimensional identity can make the transition to motherhood quite difficult, as juggling the athlete identity with the new mother identity is needed. 14,16 However, it is possible for some athletes to find balance and have a coexisting athlete-mother identity. Development of personal identity is not an individual process but can also be influenced by social experiences. 16 In the workplace, anticipated discrimination affects employees' decision-making regarding disclosure of their pregnancy.¹⁷ Furthermore, athletes in the study by Davenport et al stated an uncertainty as to whether they would be respected and accepted by those they told about their pregnancy. 14 Thus, an athlete may choose to conceal her pregnancy if she expects to be perceived as less of an athlete, either by herself or the people around her.

The extant literature on athlete pregnancy disclosure has 2 primary limitations. First, the focus on elite athletes has led to greater emphasis on scholarship and sponsorship with less focus on confidence in the AT, perceived training and performance changes, or athletic identity. Second, qualitative researchers have not examined how these factors relate to each other or simultaneously predict disclosure. Therefore,

the purpose of the current study was to examine factors related to pregnancy disclosure besides scholarship and sponsorship using a quantitative approach. Specifically, we examined whether confidence in the AT, perceived training and performance changes, and athletic identity would be associated with a Division III student-athlete's decision to disclose pregnancy. Based on previous qualitative research, we hypothesized that pregnancy disclosure would be associated with greater confidence in the AT, higher perceived performance and training levels during pregnancy, and a less unidimensional athletic identity.

METHODS

Participants

An initial sample of 141 participants was recruited for participation. After exclusion of participants who reported receiving scholarships or sponsorships of any kind, our final sample was 127. Participants were student-athletes (age = 19.6 ± 1.16 years, non-Hispanic White = 91%) who were on women's varsity or club sports rosters at the Division III level in the Midwestern United States. They were drawn from 10 different sports, including team and individual sports.

Survey

The survey was developed by members of the research team, which included expertise in athletic training as well as sport and exercise psychology. Items were derived by aligning with findings from existing literature. A review process to establish content validity was completed before distribution of the survey. Subject matter experts, including a physical therapist who specializes in pelvic health, a Title IX coordinator, an associate athletic director, and a certified nurse practitioner, reviewed each section of the survey and provided feedback in 4 categories: relevance (ie, the items are important or essential enough to warrant inclusion), sufficiency (ie, items measure the dimension in which they are included), clarity (ie, the words and sentence structure of the items can be easily understood), and coherence (ie, items actually relate to the dimension they are meant to measure). 18 This process led to revisions and modifications necessary to distribute the survey to the population of interest. Examples of modifications included asking timeline-based questions in terms of months instead of weeks and using colloquial terms related to our time to disclosure measure (eg, "as late as possible" or "when I start to show signs/symptoms").

The demographics section consisted of age, sex, sport(s), position, and race or ethnicity. In addition, 5 questions assessed specifics on the athlete's current training and performance (eg, "How many hours of the week do you spend training?") and 5 questions asked about their perceptions of exercise guidelines during pregnancy (eg, "At what month of pregnancy should an athlete decrease training intensity?"). Despite some consensus on these guidelines across different organizations, participation and management of the pregnant athlete is often done on a case-by-case basis. ^{19,20} Therefore, these were not treated as an assessment of knowledge.

Five items asked about the athlete's confidence in her AT to manage pregnancy (eg, "If you were to become pregnant, how confident are you in your athletic trainer's ability to facilitate your physical care?"). The response options for this question were on a scale from 1 (not confident at all)

to 5 (extremely confident). In this section, a higher score would indicate that the athlete has more confidence and trust in her AT. The Cronbach α coefficient for the 5 items in this scale was 0.88, suggesting strong internal consistency reliability of the measure.

Four items related to the athlete's perception of how her training and performance would change if she were to become pregnant (eg, "If you were to become pregnant, how do you think the intensity of your training will be affected?"). The response options for this question were on a scale from 1 (lower intensity) to 7 (higher intensity), with higher scores indicating an increasing level of participation, training, or performance while pregnant. The Cronbach α coefficient for this 4-item scale was 0.81, suggesting strong internal consistency reliability of the measure.

Two scales were used for the variable of athletic identity. The Athletic Identity Measurement Scale (AIMS) was used to examine the unidimensionality of the participant's athletic identity. No modifications were made to the original 10 items in this instrument (eg, "Sport is the most important part of my life."). The response options for this question were on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores representing a more unidimensional athletic identity. The Cronbach α coefficient for this scale was 0.81, suggesting strong internal consistency reliability of the measure.

In addition to the AIMS measure, 5 items were developed related to how the athlete believes her athletic identity may change if she were to become pregnant (eg, "If I were to become pregnant, my coaches would still perceive me as an athlete."). The response options for this question are on a scale from 1 ($strongly\ disagree$) to 5 ($strongly\ agree$), with higher scores representing a greater ability to be perceived as an athlete while pregnant. This was treated as a variable distinct from the AIMS measure for the purpose of the analysis. The Cronbach α coefficient for the 5 items in this scale was 0.83, suggesting strong internal consistency reliability of the measure.

Disclosure was measured in 2 forms: likelihood to disclose and time to disclosure. Likelihood to disclose was measured using 4 items with the stem, "If you were to become pregnant, how likely are you to tell your . . ." followed by "athletic trainer," "coach," "teammates," and "friends/family." Responses were rated on a scale from 1 (not at all likely) to 5 (extremely likely). Time to disclosure was measured with the same reference to the AT, coach, teammates, and friends or family but with the stem of, "When would you tell your . . ." and with scores ranging from 1 (never) to 5 (immediately). It should be noted here that higher scores represent earlier disclosure of pregnancy. Likelihood to disclose and time to disclosure presented with Cronbach α coefficients of 0.73 and 0.71, respectively, representing good internal consistency reliability of the 4 items from each scale.

At the end of the survey, we included a question asking whether the participant had ever previously been pregnant as well as an open-ended question (ie, "Are there any other factors that would affect your decision to tell your athletic trainer you are pregnant?"). The latter was meant to explore additional variables that may not have been found in previous research or included in the current study. The full survey consisted of 51 items.

Procedure

After institutional review board approval, an in-person meeting was organized with each team that was willing to participate. Before taking the survey, athletes were informed of the purpose of the research. Confidentiality and consent were discussed before completion of the survey. Consent was implied by the student-athlete completing and returning the survey to the investigators after receiving verbal and written information.

Data Analysis

Two separate simultaneous multiple linear regression analyses were performed. Both included 4 predictors: confidence in the AT, perceived training and performance changes, athletic identity (as measured by the AIMS), and athletic identity during pregnancy. One regression was with the outcome of likelihood to disclose while the other was with the outcome of time to disclosure. The full sample was used for each of these regressions and was not grouped for either analysis.

RESULTS

Perceptions of Exercise During Pregnancy

In general, exercise was considered safe during pregnancy by 122 (96.1%) of the participants. The most common respondents for when to discontinue contact sport were at 1 month and 3 months, both reported by 25 (19.7%) respondents. When to decrease training reached less of a consensus, with the most common response being 4 months (n = 20, 15.7%), followed by 3 months (n = 18, 14.2%), then 6 months (n = 17, 13.4%). At least 1 respondent selected 9 months for each of these questions.

Descriptive Statistics

Variables of interest were analyzed with descriptive statistics. Confidence in the AT centered around the middle of the scale (mean = 3.00 ± 1.00). On average, athletes expected a considerable decrease to their training and performance if they were to become pregnant (mean = 2.06 ± 1.00). As expected, participants reported a higher athletic identity (mean = 3.85 ± 0.57) but were relatively neutral as to whether they would still be viewed as athletes if they were to become pregnant (mean = 2.79 ± 0.84). In aggregate, the participants reported their likelihood to disclose to be around the middle of the scale (mean = 3.26 ± 0.89). Finally, the average time to disclosure was around the score with the anchor of "When I start to show symptoms" (mean = 3.19 ± 0.73).

Additional Survey Questions

No participants reported previously being pregnant. The open-ended question returned multiple factors beyond those in the study that may influence an athlete's decision to disclose her pregnancy. While the majority (n = 97) reported no additional reasons, other possible factors included a personal relationship with the AT (n = 15), consideration of abortion (n = 5), time of season or career, and others. A full list of responses to this question can be found in the Supplemental Table, available online at http://dx.doi.org/10.4085/1062-6050-0498.23.S1.

Table 1. Descriptive Statistics and Correlations for Study Variables of the Final Sample $(n = 127)^a$

	1	2	3	4	5	6
Confidence in athletic trainer	0.88					
2. Training and						
performance	0.320 ^b	0.81				
Athletic identity	-0.067	-0.047	0.81			
Athletic identity						
during pregnancy	0.476°	0.241	0.003	0.83		
Likelihood to						
disclose	0.516°	0.058	0.015	0.502°	0.73	
6. Time to disclosure	0.363°	0.098	-0.056	0.373°	0.657 ^b	0.71

^a Cronbach α coefficients along diagonal (italics).

Correlations

Significant correlations (P < .01) were found between confidence in the AT, athletic identity during pregnancy, and the 2 disclosure measures. All these correlations were in the expected directions and ranged in strength from small to moderate. Only confidence in the AT was significantly correlated with the variable of perceived training and performance changes. No statistically significant correlations were found with athletic identity as measured by the AIMS. Means \pm SDs, correlations, and Cronbach reliability scores of all variables can be found in Table 1.

Regression Analysis

We performed 2 regression analyses for the variables of interest with different outcomes: likelihood to disclose and time to disclosure. The likelihood to disclose model was significant ($F_{4,119}=17.735,\,P<.001$). Three significant predictors emerged: confidence in the AT ($\beta=.402,\,P<.001$), perceived training and performance changes ($\beta=-.153,\,P=.05$), and athletic identity during pregnancy ($\beta=.347,\,P<.001$). Together, these predictors explained 37.3% of the variance in the likelihood to disclose pregnancy.

The time to disclosure model was also significant ($F_{4,119} = 6.857$, P < .001). Uniquely, only confidence in the AT ($\beta = .249$, P < .011) and athletic identity during pregnancy ($\beta = .265$, P < .006) were significant predictors. Together, these predictors explained 18.7% of the variance in the time to disclosure. Athletic identity as measured by the AIMS was not a predictor in either model. Full results of the regression analyses can be found in Table 2.

DISCUSSION

The purpose of the current study was to quantitatively examine factors related to Division III athletes' beliefs about their disclosure of pregnancy in a hypothetical scenario. We selected factors based on extant qualitative research with elite athletes. Analyses were conducted with the goal of gaining a better understanding of how these variables can simultaneously predict an athlete's decision-making regarding pregnancy disclosure.

Confidence in the AT was a significant positive predictor in both the likelihood to disclose model and the time to disclosure model. This would mean that, if an athlete believes her AT could successfully help her manage her physical,

Table 2. Regression Coefficients of Confidence in the Athletic Trainer, Perceived Training and Performance Changes, Athletic Identity, and Athletic Identity During Pregnancy on Likelihood and Time to Disclosure

		Likelihood to Disclose		Time to Disclosure	
	β	t	β	t	
Confidence in athletic trainer	.402ª	4.722	.249ª	2.572	
Training and performance	153^{b}	-1.980	048	-0.541	
Athletic identity	.034	0.466	043	-0.514	
Athletic identity during pregnancy	.347ª	4.181	.265ª	2.807	
R^2	0.3	0.373 17.735ª		0.187	
F	17.7			6.857 ^a	

a P < .05.

mental, and emotional health during pregnancy while also respecting her confidentiality, she would be more likely to disclose and would disclose her pregnancy sooner. This is in line with our hypothesis as well as previous literature. A patient is less likely to disclose personal information if he or she lacks trust in the health care provider. This trust is situation specific and may not always reflect the overall trust a patient has in a provider. Considering the vulnerable position in which an athlete is placed when pregnant, the level of trust the athlete has with the AT is pivotal to her decision to disclose.

Perception of training and performance changes was only related to the likelihood to disclose and, as a predictor, was precisely at the threshold of significance (P = .05). Thus, our hypothesis was only partially supported. If an athlete expects greater decreases in performance and ability to train, she is less likely to disclose to the people around her. This is in line with previous research, in which researchers have suggested status on the team may influence an athlete's pregnancy disclosure decisions. 14 It is important to note that not all respondents expected their training and performance to decline if they were to become pregnant. Considering this alongside the significant positive correlation between training or performance changes and confidence in the AT, it is possible that an athlete who is more confident in her AT to help her manage her pregnancy may expect less severe performance decrements. Such relationships further emphasize the importance of the role of the AT in an athlete managing her pregnancy.

Athletic identity was measured using 2 scales. The first (AIMS) measured how important sport was to the athlete's overall identity.²¹ Additional questions were added to interpret the effect pregnancy would have on her athletic identity. No relationship was found between athletic identity (as measured using the AIMS) and either of the disclosure measures. However, our results showed a relationship between athletic identity during pregnancy and both disclosure measures. Thus, our hypothesis was partially supported. Previous researchers have suggested that athletic identity could be a factor in athletes choosing to conceal their pregnancy. 14,17 Athletes feel a common societal narrative in which they must choose between being an athlete or being pregnant, a pressure which makes them feel like they cannot live both lives. 14 Our findings suggest an athlete would be more likely to disclose pregnancy if she expects those around her will still perceive her as an athlete. In this scenario, less pressure on choosing one identity would exist, giving the athlete hope to one day find a balance between the mother identity and athlete identity.

^b P < .05.

[°] P < .01.

b P = .05.

When taken as a whole, the results provide greater understanding of the factors previously suggested to influence an athlete's decision to disclose pregnancy. Specifically, an athlete may be more likely to disclose her pregnancy and disclose sooner if she is confident in her AT's ability to manage her pregnancy and feels that those around her will still perceive her as an athlete. This is independent of her overall athlete identity when not pregnant. Further, perceived training and performance changes may not be as reliable a predictor as previously purported, at least not in this sample of Division III athletes. A Division III athlete may choose to disclose or conceal her pregnancy without regard for how she expects her training or performance to change.

Implications

In the context of the existing literature, it is important to consider how training and performance relates to other potential factors. Under the current NCAA Division Manuals, the "Pregnancy Exception" states that a member institution may allow additional eligibility time (1 year at Division I, a 2semester or 3-quarter extension of the 10-semester/15-quarter period at Division II and III) for any athlete who becomes pregnant during her collegiate experience.²³ However, the manuals do not state the conditions under which an athlete's scholarship is protected.²⁴⁻²⁶ Thus, athletic and academic administrators are left with little guidance on how to financially support the pregnant student-athlete. In our study, we emphasize the importance of providing this guidance when developing an effective student-athlete pregnancy and parenting policy,²³ as it appears athletes may care about training and performance changes only as related to their student-athlete status and position on the team.

In addition to NCAA policies, other implications of this research are related to the athlete's support personnel. Specifically, the predictive quality of confidence in the AT brings light to the importance of ATs having knowledge of exercise during pregnancy. Current standards set forth by the CAATE include conditions of the reproductive system but not pregnancy explicitly. Ensuring ATs are knowledgeable about pregnancy and are involved in policy and procedure development may make athletes more comfortable disclosing their pregnancy and initiating proper management of their health and safety.

Limitations

A few limitations to this research exist. First, the sample was homogeneous, limited to Division III athletes who were predominantly White, competed within a small region of the United States, and reported no history of pregnancy. This may have led to respondents having similar experiences with the sports medicine team, thus not reflecting the full population of interest (possibly evidenced by the values for confidence in the AT, which centered around the midpoint of the scale). While specific recruitment of Division III athletes was necessary for the purpose of this study, historical reasons exist for why a more geographically and ethnically diverse sample would be beneficial to this research. According to the Centers for Disease Control and Prevention, Black women are 3 times more likely to die from a pregnancy-related cause than White women.²⁷ Many of these deaths are preventable, whether it be related to access to health care, chronic underlying conditions, or social determinants. Historically, health care disparities

have also affected individuals' behavior related to seeking medical attention.²⁸ Thus, a more diverse sample could have helped determine how health care disparities could influence athletes' willingness to disclose pregnancy.

It is also important to note that, in this study, we did not recruit athletes who were actively pregnant or had previous experience with pregnancy. In fact, none of the participants reported previous pregnancy when asked toward the end of the survey. How they would respond to an actual pregnancy may differ from what was reported in this study, and this needs to be considered when interpreting the results.

Future Directions

In addition to addressing the previously described limitations, future researchers could expand on the findings of the current study. We did not include financial factors in this study, but combining scholarship and sponsorship with those in this study will help to close the gap in the literature on pregnancy in athletics. Furthermore, future researchers could explore pregnancy education for coaches and ATs. It is unknown how much time is spent on pregnancy during the formal education of ATs. Greater education may lead to ATs being better prepared to anticipate the needs of a pregnant athlete, thus making athletes more comfortable with disclosing their pregnancy. Future researchers could find where the gaps are in AT education.

The open-ended question at the end of the survey revealed additional factors for exploration. While such variables have not been as present in previous literature, this research topic is a complex issue deserving of continued research to examine the nuance of pregnancy disclosure in athletics. We hope the factors reported by these participants can lead to many studies on the topic.

CONCLUSIONS

Pregnant athletes cannot receive proper care if they choose to conceal their pregnancy. The current study found 2 significant predictors that Division III athletes believe would be associated with their likelihood to disclose pregnancy and how far into the pregnancy this disclosure would occur: confidence in the AT to manage their pregnancy and athletic identity during pregnancy. This suggests that a pregnant athlete will be more likely to seek out the necessary care if she feels she is surrounded by supportive personnel who would competently manage the physical, emotional, and social dynamics of pregnancy.

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DISCLOSURE

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SUPPLEMENTAL MATERIAL

Supplemental Table. Categories of Responses to the Final Survey Question: "Are There Any Other Factors That Would Affect Your Decision to Tell Your Athletic Trainer You Are Pregnant?"

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