

# Influence of decision support persons on breast cancer treatment decisions among Latinas

Krystal A. Morales (✉ [mkystal@med.umich.edu](mailto:mkystal@med.umich.edu))

University of Michigan Michigan Medicine <https://orcid.org/0000-0003-2578-027X>

Paul H. Abrahamse

University of Michigan Michigan Medicine

Christine M. Veenstra

University of Michigan Michigan Medicine

Reshma Jagsi

University of Michigan Michigan Medicine

Sarah T. Hawley

University of Michigan Michigan Medicine

Lauren P. Wallner

University of Michigan Michigan Medicine <https://orcid.org/0000-0002-1279-8617>


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## Research Article

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# Abstract

**Purpose:** Latinx experiences within cancer treatment decision-making remain largely understudied. We examined breast cancer treatment decision-making among Latina patients and their Latinx decision support persons (DSP).

**Methods:** Women with newly diagnosed early-stage breast cancer (2014-2015) as reported to Surveillance, Epidemiology, and End Results (SEER) registries of Georgia and Los Angeles County, were surveyed (N=2502). Respondents identified the key DSPs in their treatment decisions, who were also surveyed (N=1203). Among 1,173 dyads, we examined: (1) bivariate associations of DSP characteristics with DSP-reported engagement, (informed about decisions, involvement (extent/satisfaction), and awareness of patient preferences), (2) DSP engagement with patient-reported subjective decision quality (SDQ) and treatment deliberation using multivariable linear regression, and (3) correlation between treatment received with DSPs treatment preferences.

**Results:** Among Latina dyads (N=292), 78%, 17%, and 5% of DSPs identified as Latinx, White, and Asian/Black/Other, respectively. The key DSP for the Latina/Latinx dyads was more often a daughter (37%), over a husband/partner (21%) when compared to all other Latina/DSP and non-Latina/DSP dyads. Latinx DSPs also reported being more informed ( $p=0.058$ ), and this was positively associated with higher patient SDQ (adjusted mean difference 0.176,  $p=0.034$ ). Latinx DSPs also had a higher preference for mastectomy, especially with reconstruction compared to non-Latinx DSPs (40% vs 28%,  $p<.001$ ).

**Conclusions:** There are key differences in the characteristics and decision-making experiences among Latina patients when their DSP is also Latinx. This is important for clinicians to recognize, promote their inclusion, and meet their information needs, which our findings suggest positively impacts Latina SDQ.

## Introduction:

Having a support system has been shown to be positively associated with patient-reported outcomes and experiences when it comes to the complex process of making breast cancer-related treatment decisions [1]. In particular, prior work has shown that having a patient-identified key decision support persons (DSPs) within this network (e.g., spouse/partner, other family member or friend), is important. Specifically, involving a DSP who is informed and aware of patient preferences promotes higher patient reported subjective decision quality (SDQ) and deliberation [1]. Most studies to date have focused on spouse/partner experience, and therefore the role, potential impact, and experiences of other DSPs also remains unknown. Prior studies focusing on Hispanic partners showed that those with low acculturation are most vulnerable to decision regret [2]. While limited, the research to date suggests that the influence or role of DSPs may differ by race/ethnicity, with less acculturated and older Latinas being more likely to delegate the final treatment decision to family members [3].

Prior work by our team has revealed that despite having the highest level of involvement in treatment decision making, Latinx DSPs reported the lowest satisfaction with their participation in breast cancer treatment decisions [4]. The reasons for this are unknown, and adequate description of Latina patients and their DSPs experiences remain largely uncharacterized, mainly due to limited sample size, and insufficient racial/ethnic diversity.

The decision support network previously identified from the Individualized Cancer Care (iCanCare) study provides a unique Latinx enriched sample to examine the breast cancer treatment experiences of Latina patients and their identified DSPs [1, 4]. As described previously, the iCanCare is a large population-based survey study of women with newly diagnosed early breast cancer, between the ages of 20 to 79 years, as reported to the SEER registries of Georgia and Los Angeles County in 2014-2015 [1, 4]. In prior work we found that younger, married/partnered, and

Latina women were more likely to report having larger decision support networks [1]. Husbands/partners were more likely to be informed about treatment options, involved during the treatment decision-making, and aware of patients preferences and values, and this was significantly associated with higher odds of patient-reported deliberation [4]. Interestingly, subgroup analyses showed that Latinas who were married/partnered maintained a larger support network [1] despite previous that had highlighted the central role of their partners in treatment decision-making [2].

Given the critical role of DSPs in cancer treatment decision-making, these findings highlight important racial/ethnic differences and support further characterization of Latina-identified DSPs and examination of their treatment decision making experiences. Therefore, we sought to identify the Latina/DSP dyads in the iCanCare Study, examine their breast cancer treatment decision making experiences in depth, identify differences between Latinx versus non-Latinx DSPs and evaluate their potential impact in Latina patient's treatment deliberation, subjective decision quality, and treatment received.

## Materials And Methods:

### *Patient population:*

As described previously, the iCanCare study is a large, population-based survey study of women with breast cancer, which accrued 3930 women, between the ages of 20 to 79 years, with newly diagnosed stage 0 to II breast cancer as reported to the Surveillance, Epidemiology, and End Results (SEER) registries of Georgia and Los Angeles County in 2014-2015 [1, 4]. Exclusion criteria included stage III or IV disease, tumors larger than 5 cm, and an inability to complete a questionnaire in English or Spanish (N = 258).

Participants (n=2502, 68% response rate) identified the DSPs who played a key role in decisions about locoregional and systemic treatment. They were then instructed to think about the person who was "most helpful" in these decisions (termed their "key DSP") and asked to either 1) provide the name and mailing address of this individual directly to our research team or 2) receive a survey packet to deliver directly to this individual (including mailing if needed; postage was included). There were 1713 eligible key DSPs who were surveyed: 783 surveys were sent directly to the DSP, and 930 were given to the DSP via the patient, and 1203 eligible DSPs (70% response rate) responded, resulting in 1,173 Patient/DSP dyads (Figure 1). For purposes of this analysis, all dyads where the patient identified as Latina (N=292) were evaluated and then compared to non-Latina patient (N=881) dyads.

The study was approved by the University of Michigan Institutional Review Board and the state and institutional (Emory University and University of Southern California) IRBs of the SEER registries.

### *DSP-reported engagement measures:*

The overall DSP level engagement was measured as previously described [2, 4, 5], with the use of four items assessing 3 domains encompassing: (1) how *informed* the DSP was about treatment options, outcomes, and risks/benefits (5-items), (2) How *aware the DSP was* of patients' values and treatment preferences (4-items), and (3) the *extent of* (6-items) *and satisfaction* with (4-items) their involvement during the decision-making process. Responses from each item within these domains were averaged and re-scaled to a 5-point scale for ease of comparison. Higher score indicated higher information, involvement, and awareness. Objective knowledge was measured as described previously with a validated 5-item knowledge scale [6, 7].

### *Patient-reported subjective decision quality and treatment deliberation measurements:*

Patient SDQ was measured with a 5-item scale assessing the degree to which the patient felt informed, involved, satisfied, and not regretful with respect to their treatment decision, as previously described [8, 9]. Deliberation was measured with a 4-item scale assessing the degree to which patients thought through their treatment-related decisions [1]. Both measures were dichotomized, where an SDQ score higher than 4 indicated greater SDQ and a deliberation score higher than 4 indicated more deliberative decision [10, 11].

#### *Other DSP-reported characteristics:*

DSP-reported objective knowledge about the different treatment options, outcomes, and risks and benefits was measured using the validated adapted 5-item scale on locoregional treatment [7]. Short Acculturation Scale for Hispanics (SASH) was used to classify low and high acculturation of Latinas as previously described [12, 13].

#### *Statistical Analyses:*

We first examined bivariate distributions between dyad type (husband/Partner, daughter, son, mother, sister, friend/other non-family) and all demographic and clinical covariates, and with the outcome scales (decision engagement, decision quality, deliberation). We utilized generalized linear modeling methods to create multivariable models of the four decision engagement scales, using dyad type as a predictor, and including demographic and clinical covariates. Finally, we created separate models of Subjective Decision Quality and Patient Treatment Deliberation, stratified by dyad type, which included the four decision engagement scales as well as demographic and clinical variables as covariates. Bivariate comparisons were tested using Chi-square tests (for categorical variables) and ANOVA tests (for continuous variables). Multivariable comparisons were tested using Wald F tests. All tests were two sided, using a significance level of .05. All analysis was done using SAS 9.4 (Cary, NC).

## **Results:**

### **DSP and Patient characteristics within dyads**

Baseline characteristics for the Latina and non-Latina patient-DSP dyads are summarized in Table 1. Among the dyads which include a Latina patient and their DSP (N=292), 78%, 17.5% and 4.5% of their DSPs self-identified as Latinx, White, and Asian/Black/Other, respectively. The Latinx DSPs within Latina/Latinx dyads were younger ( $p<0.0001$ ), and had lower educational attainment ( $p<0.0001$ ) and acculturation ( $p<0.0001$ ) when compared to Latina patient/non Latinx dyads. Latinx DSPs mean age was 44 years, 80% were of Mexican origin, 41% had low acculturation, and only 26.6% had a college graduate degree or higher (Table 1). Overall, 46% and 55% of Latina patients in this cohort had high and low acculturation, whereas 59% and 41% of Latinx DSPs had high and low acculturation, respectively. While 40% of low acculturation Latina patients chose a highly acculturated Latinx DSP, 60% of Latina patients with low acculturation identified a key DSP who also had low acculturation (data not shown). Overall, high acculturated Latinas paired consistently with highly acculturated Latinx DSPs (82%) (data not shown).

Patient characteristics did not vary by marital/partnered status, surgery received or delivery of adjuvant radiation. There were statistically significant differences across age ( $p<0.0001$ ), stage at diagnosis ( $p=0.009$ ), and the proportion who received chemotherapy ( $p=0.01$ ) (Table 1). While the proportion (68%) who were married or partnered was not statistically significantly different across dyads ( $p=0.332$ ), the identified key DSP for Latinas within the Latina/Latinx dyads was more often a daughter over a husband/partner (37% vs 21%) (Table 1). This contrasts with all other dyads where husband/partner was preferred over daughter: Latina/White DSP (59% vs 16%), Latina/Other race/ethnicity DSP (46% vs 15%), and non-Latina patient/DSP dyads (47% vs 17%).

The identified key DSP within Latina/Latinx dyads was similar regardless of the patient marital status (Figure 2 and Table S1). Married/partnered and not married/partnered Latinas were still more likely to choose a daughter as their DSP over a husband, other family-member (i.e., mother, son, sister), or friend, when compared to all other Latina/DSPs (Latina/White, Latina/Other) and non-Latina patient/DSP dyads (Figure 2). Overall, among the married/partnered patients, the third most common DSP after a daughter or husband was a Friend/Non-family member (Table S1). For not married/partnered patients, daughters remained the preferred DSPs for the Latina/Latinx dyads as discussed, however for all other dyads a Friend/Non-family member was the most common DSP, followed by a daughter, and a sister (Figure 2).

### **DSP characteristics and level of engagement**

Table 2 displays the multivariable-adjusted mean DSP-reported engagement scores across the 4 domains (being informed, extent of involvement, satisfaction, awareness), stratified by dyad type. Latinx DSPs reported being more informed (adjusted mean 4.26,  $p=0.058$ ) compared to the other dyads after adjusting by DSP age, type, education, race, ethnicity, as well as patient age, stage, surgery type, and delivery radiation and/or chemotherapy (Table 2). No statistically significant differences were seen for the other DSP engagement domains (Involved extent, satisfaction, and awareness) (Table 2).

### **Association of DSP-reported engagement and knowledge with patient-reported SDQ and treatment deliberation**

Table 3 displays the multivariable-adjusted mean differences in patient-reported SDQ and treatment deliberation for each of the 4 DSP-reported engagement measures, stratified by DSP type. A more informed Latinx DSP within the Latina/Latinx dyads was positively associated with higher patient reported SDQ (adjusted mean difference 0.176,  $p=0.034$ ), despite no statistically significant difference in treatment deliberation ( $-0.024$ ,  $p=0.787$ ) (Table 3). No statistically significant associations were observed for the Latina/non-Latinx dyads. Within non-Latina patient/DSP dyads, having a highly informed and aware DSP was associated with higher patient reported SDQ (adjusted mean difference, 0.115,  $p=0.001$ ) and treatment deliberation (adjusted mean difference, 0.138,  $p<0.001$ ), respectively.

### **Correlation between DSP preferred treatment and patient received treatment**

Within the entire sample of dyads (both Latina/DSP dyads [N=292] and non-Latina/DSP dyads [N=881]), 61% and 39% of patients underwent lumpectomy and mastectomy, respectively (Figure 3A). The proportion of mastectomy with and without reconstruction was 22% and 17%. Overall, there was high concordance between treatment received by patient and her DSPs' preferred treatment (Figure 3A).

When stratified by Latina patient (Figure 3B) and non-Latina patient dyads (Figure 3C), the distribution of patients' treatment received did not vary, but there were differences between their DSPs preferred treatment among Latinas (Figure 3B). Latinx DSPs within Latina/Latinx dyad had a notably higher preference for mastectomy (56%, Figure 3B) when compared to DSPs for non-Latina patients (non-Latina/DSPs) (43%, Figure 3C), specifically for mastectomy with reconstruction (40%) when compared to non-Latina/DSP dyads (28%) (Figure 3, panels B and C). Over a quarter (27%) of Latina patients (versus 13% of non-Latina patients), underwent lumpectomy despite their DSPs preference for mastectomy (See Table S2.1 and S2.2). Overall, DSPs preference for mastectomy was greater than the proportion of patients who underwent mastectomy with reconstruction (22%). Despite these differences seen in the proportions of DSP preferred treatment and patient received treatment, concordance analysis showed overall good agreement for both Latinas (82%,  $\kappa=0.651$ ) and non-Latina patient dyads (90%,  $\kappa=0.790$ ).

## **Discussion:**

Our findings in this large and diverse cohort study of women diagnosed with early-stage breast cancer and their primary decision support person highlight key differences in the characteristics and decision-making experiences among Latina patients/Latinx DSP dyads, when compared to Latina patient/non-Latinx DSP dyads. The majority of Latina patients in this cohort identified a Latinx individual as their preferred DSP, who was more often a daughter, rather than husband/partner, when compared to other dyads. Latinx DSPs reported being more informed, which was positively associated with higher SDQ among Latina patients. Latinx DSPs also had a higher preference for mastectomy, especially with reconstruction when compared to non-Latina patient DSPs. Our findings increase our understanding of critical differences present within Latina patients and their designated DSPs when making decisions about their breast cancer. Understanding differences in Latinas' experiences with breast cancer treatment decision making is a critical step to identifying and implementing strategies to mitigate disparities in both treatment decision making and outcomes.

Among Latina-Latinx DSP dyads we observed that Latinx DSPs were younger and had lower educational attainment, and acculturation when compared to Latina/non-Latinx DSP dyads and non-Latina/DSP dyads. Moreover, our data showed that more than half of patients with low acculturation also selected a DSP with low acculturation. This is of critical relevance, as previous work has shown that low acculturation has been linked to lower education and literacy among Latinas [13]. Specifically Spanish-preferent Latina patients had higher odds of treatment dissatisfaction and regret [10]. Similarly, a study focusing on the partner/husband experience, showed that less acculturated Hispanic partners/husband had higher decision regret and the factors associated were the insufficient receipt of treatment information, low involvement in decision making, and a desire for more involvement [2]. While fortunately these appeared to be issues for which easily implemented interventions could be applied, many uncharacterized aspects specific to this population could also play a role.

Among all dyads, Latinx DSP partnered with Latina patients reported being more informed, when compared to all other patient/DSP dyads. Being more informed was positively associated with higher patient SDQ. This builds upon our prior work in this cohort which found that engaging a DSP in breast cancer treatment decision making results in greater subjective decision quality and deliberation [4]. Being informed is a key component of SDQ, so a more informed DSP may be contributing specifically to that component of decision quality. However, feeling that one is informed is not necessarily the same as having objective knowledge about breast cancer treatment options. In our data, objective knowledge was not associated with SDQ or deliberation, which suggests that differences in perceptions of being informed and actually having objective knowledge about treatment options may contribute to our results. While we previously found that specific domains of DSP engagement (i.e., awareness) were associated with greater deliberation, that was not the case among dyads paired with a Latina patient in this analysis. Taken together, these domains of DSP engagement warrant future research to identify actionable targets for interventions amongst this potentially vulnerable population where barriers related to language and health literacy may be especially common.

While overall surgical treatment satisfaction was high among all dyads and Latinx DSPs also reported high satisfaction with respect to their family/friend involvement in their own care, differences were seen in the Latinx DSP's surgical preferences. Latinx DSPs' preference for mastectomy was higher when compared to non-Latina patients DSPs, specifically for mastectomy with reconstruction, which represents a potential area for quality improvement derived from this study. These differences in DSP-reported treatment preferences by race/ethnicity may in part be due to cultural differences in perceptions and fears about related to mastectomy and reconstruction specifically or could be in part attributable to differences in who the DSP is in relation to the patient. Nonetheless, this represents an area where physicians should ensure both patients and their DSPs have clear knowledge of

reconstructive options. While recent studies suggest that the gap might be closing for some minority groups and more Hispanic women are receiving reconstruction, differences in the type and rates of reconstruction persist [14, 15]. Furthermore, prior studies suggest less acculturated Latinas had a lower receipt of breast reconstruction [16, 17] and chemotherapy [18]. It is therefore important that we elucidate the differences within the Hispanic population and examine the influence of acculturation on these associations in future studies. It is also important that at the state and institutional levels to measure the proportion of the population that is underserved and/or underrepresented, including the distribution of acculturation. This will help ensure that policies are optimized to address the needs of these populations [19].

In aggregate, our study highlights the importance of DSPs in breast cancer decision making, and it sheds light on the treatment decision making experiences of Latina patients and their DSPs specifically. Therefore, it has important clinical implications. Interventions focused on improving breast cancer decision making should be multi-level and include DSPs. Interventions in this space should be culturally tailored, and take into account language, education, literacy, and structural barriers to optimal decision processes that are more common amongst Latinas. Physicians should be aware of differences in DSP characteristics, involvement and treatment preferences and make efforts to tailor their information and discussions appropriately when counseling Latina patients. At the clinic and institutional levels, increasing the consultation visit allocated time for patients requiring translation services and availability of language-tailored department resources is important. Finally, as Latina DSPs report being more informed than other DSPs, efforts should focus on improving other aspects of engagement, or sustaining their engagement over time throughout all breast cancer treatment decisions.

Although our study was a large, population-based survey in a diverse sample of patients and DSPs with high response rates, and used novel methodology to identify and survey DSPs, there are potential limitations that warrant comment. First, we did not ask patients or DSPs specifically about the availability and use of written or web-based information tools in Spanish or the use of official translation services versus family/DSP-provided translation, particularly during initial consultation and important decision-making appointments. Access to these resources may have an impact on the quality and amount of information shared during an encounter. There is a potential for recall bias. However, we surveyed patients and DSPs soon after the patients were diagnosed, using rapid-case ascertainment methods in the SEER registries, anchored on a memorable life event, which increases the accuracy of recall. It is also possible that DSPs who did not respond to our survey differed in important ways from those who did respond. However, our high response rate mitigates these concerns. While our novel measures of DSP engagement were created for this study, they were based on existing frameworks and subject to extensive pilot testing. However, they should be validated in other populations of patients with cancer and their DSPs. Finally, our study included only women diagnosed in two geographic areas of the United States, and therefore these findings may not be generalizable to other geographic regions.

## **Conclusion:**

These findings reveal that the key DSP for Latina patients with breast cancer is often a daughter over any other family and non-family member. There are also key differences in the characteristics and decision-making experiences among Latina patients-Latinx DSP dyads, when compared to Latina patient-non-Latina DSP dyads. This is important for clinicians to recognize, so that they promote DSPs' inclusion in critical treatment decisions and tailor strategies to meet their information needs, which as suggested by our data positively impacts Latina patients' SDQ. Potential areas of improvement derived from this study relate to the discussion of breast surgical options, where notable variation in preferences were observed between Latinx and non-Latinx DSPs. Awareness of these differences can

help to optimize practice to minimize treatment regret and improve decision quality and ultimately outcomes in Latinas.

## Declarations:

### Statements and declarations:

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**Conflict of interests:** The authors have no relevant financial and non-financial interests to disclose.

**Authors contributions:** Conceptualization, data curation, and review/editing were performed by K.A.M., P.H.A., C.M.V., S.T.H., R.J., and L.P.W. Original draft preparation was performed by K.A.M. and L.P.W. All authors have read and agreed to the published version of the manuscript.

**Data availability:** The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

**Ethics approval:** The study was approved by the University of Michigan Institutional Review Board and the state and institutional (Emory University and University of Southern California) IRBs of the SEER registries.

**Consent to participate and Consent to published:** Patients and support persons were mailed surveys and completed surveys returned were considered consent to participate, and the participants consented to their answers being disseminated in publications.

### Authors contributions:

Conceptualization, data curation, and review/editing were performed by K.A.M., P.H.A., C.M.V., S.T.H., R.J., and L.P.W. Original draft preparation was performed by K.A.M. and L.P.W. All authors have read and agreed to the published version of the manuscript.

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## Tables:

<i>Latina patients/DSP</i>					
	<i>Latina/Latinx</i>	<i>Latina/White</i>	<i>Latina/ [Asian/Black/Other]</i>	<i>Non-Latina/all DSPs*</i>	<i>p-value</i>
	<i>No. (%)</i>	<i>No. (%)</i>	<i>No. (%)</i>	<i>No. (%)</i>	
<b><i>DSP characteristics</i></b>					
Mean DSP Age (Range)	44 (30-58)	53 (39-68)	57 (43-71)	56 (42-70)	<.0001
<b><i>DSP Type No. (%)</i></b>					
					<.0001
Husband/Partner	47 (20.6)	30 (58.8)	6 (46.2)	417 (47.4)	
Daughter	85 (37.3)	8 (15.7)	2 (15.4)	151 (17.2)	
Son	14 (6.1)	1 (2.0)	0 (0)	26 (3.0)	
Mother	27 (11.8)	1 (2.0)	0 (0)	48 (5.5)	
Sister	19 (8.3)	1 (2.0)	1 (7.7)	71 (8.1)	
Friend/other non-family	36 (15.8)	10 (19.6)	4 (30.8)	166 (18.9)	
<b><i>Education</i></b>					
					<.0001
High School or less	94 (41.6)	7 (13.7)	4 (30.8)	136 (15.3)	
Some College	72 (31.9)	14 (27.5)	4 (30.8)	289 (32.5)	
College Graduate or higher	60 (26.6)	30 (58.8)	5 (38.5)	464 (52.2)	
<b><i>Race/Ethnicity</i></b>					
					<.0001
White	115 (49.8)	45 (88.2)	1 (7.7)	601 (67.4)	
Asian	1 (0.4)	0 (0)	4 (30.8)	86 (9.6)	
Black	2 (0.9)	0 (0)	4 (30.8)	195 (21.9)	
Other	113 (48.9)	6 (11.8)	4 (30.8)	10 (1.1)	
<b><i>Hispanic/Latino/Spanish origin</i></b>					
					<.0001
Mexican	164 (80.4)	12 (27.2)	2 (25.0)	0 (0)	
Caribbean (PR, Cuban)	12 (5.9)	2 (4.6)	0 (0)	0 (0)	
Central America	18 (8.8)	0 (0)	0 (0)	0 (0)	
South America	6 (2.9)	0 (0)	0 (0)	0 (0)	

European	4 (1.9)	4 (9.1)	9 (12.5)	0 (0)	
Not Hispanic	0 (0)	26 (59.1)	5 (62.5)	881 (100)	
<i>Acculturation</i>					<.0001
High acculturation	136 (58.9)	48 (94.1)	10 (76.9)	845 (94.7)	
Low acculturation	95 (41.1)	3 (5.9)	3 (23.1)	5.3 (5.3)	
<b><i>Patient Characteristics</i></b>					
Mean age at diagnosis (Range)	57 (46-68)	56 (45-67)	60 (49-71)	61 (50-71)	<.0001
<i>Marital/Partnered Status</i>					0.332
Married/partnered	142 (61.5)	38 (74.5)	9 (69.2)	582 (65.3)	
Not married/partnered	89 (38.5)	13 (25.5)	4 (30.8)	310 (34.8)	
<i>SEER Summary Stage</i>					
0	42 (18.8)	7 (13.7)	2 (16.7)	134 (15.5)	0.009
I	100 (44.8)	26 (51.0)	7 (58.3)	512 (59.2)	
II	81 (36.3)	18 (35.3)	3 (25.0)	219 (25.3)	
<i>Surgery</i>					0.186
Lumpectomy	138 (59.7)	29 (56.9)	5 (38.5)	565 (63.3)	
Mastectomy	93 (40.3)	22 (43.1)	8 (61.5)	327 (36.7)	
<i>Radiation</i>					0.881
Yes	114 (49.4)	26 (51.0)	5 (38.5)	437 (49.0)	
No	117 (50.6)	25 (49.0)	8 (61.5)	455 (51.0)	
<i>Chemotherapy</i>					0.010
Yes	92 (39.8)	14 (27.5)	2 (15.4)	261 (29.3)	
No	139 (60.2)	37 (72.5)	11 (84.6)	631 (70.7)	

**Table 1.** Characteristics of non-Latina (N=881) and Latina (N=292) patients and their DSPs stratified by race/ethnicity. This DSP group includes all race and ethnicities.

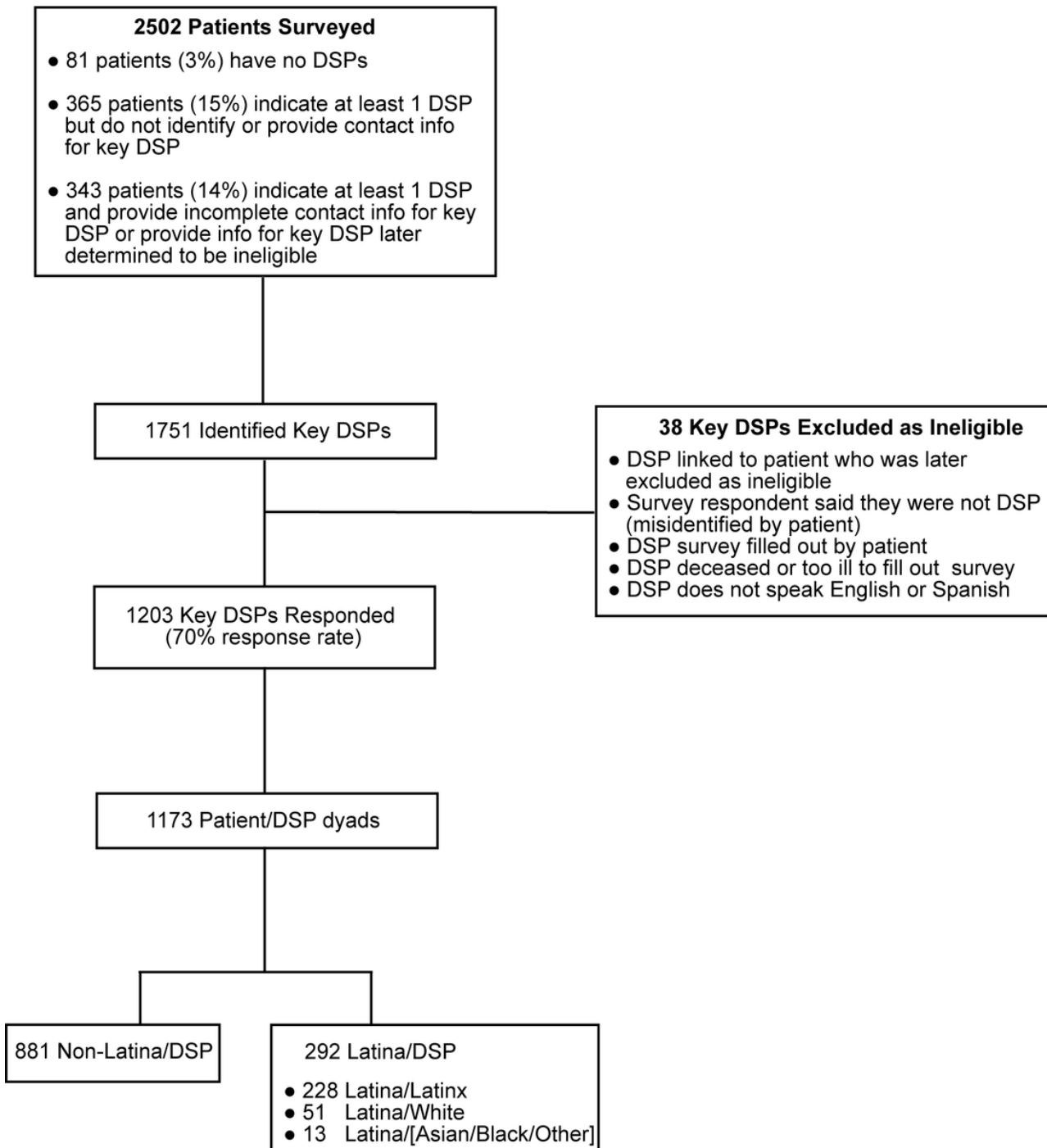
DSP dyads	Informed Score (95% CI)	Involvement Extent Score (95% CI)	Involvement Satisfaction Score (95% CI)	Awareness Score (95% CI)
Latina/Latinx	4.26 (3.57-4.96)	3.87 (3.37-4.38)	3.64 (3.26-4.01)	3.79 (3.26-4.32)
Latina/White	3.47 (2.96-3.97)	3.43 (3.06-3.80)	3.59 (3.32-3.86)	3.82 (3.44-4.21)
Latina/[Asian/Black/Other]	3.11 (2.08-4.13)	3.37 (2.62-4.11)	3.89 (3.34-4.44)	3.61 (2.82-4.40)
Non-Latina	3.63 (3.42-3.84)	3.59 (3.43-3.74)	3.99 (3.87-4.10)	3.87 (3.70-4.03)
p-value	0.058	0.243	0.132	0.947

**Table 2.** Multivariable-adjusted mean scores of DSP-reported engagement across the 4 domains (Informed, extent of involvement, involvement satisfaction, awareness) by dyad type. Scores were adjusted by DSP age, DSP type, education, race, ethnicity, as well as patient age, stage, surgery type, and addition to delivery radiation and/or chemotherapy. Responses from all items assessing each domain were averaged and rescaled to range from 0 to 5, for comparison, where higher score indicating higher informed, involvement, and awareness level as described in the methods section.

Patient/DSP dyads	Subjective Decision Quality		Patient Treatment Deliberation	
	*Adjusted Mean Difference (95% CI)	p-value	*Adjusted Mean Difference (95% CI)	p-value
<b>Latina patient/Latinx</b>				
Informed	0.176 (0.013 - 0.339)	0.034	-0.024 (-0.195 - 0.148)	0.787
Involved	0.127 (-0.064 - 0.318)	0.192	0.039 (-0.162 - 0.240)	0.702
Aware	-0.023 (-0.189 - 0.142)	0.780	0.056 (-0.116 - 0.228)	0.522
Objective knowledge	0.143 (-0.014 - 0.299)	0.074	0.011 (-0.153 - 0.176)	0.891
<b>Latina patient /Non-Latinx</b>				
Informed	0.302 (-0.033 - 0.637)	0.075	0.006 (-0.437 - 0.448)	0.980
Involved	-0.186 (-0.645 - 0.274)	0.415	0.251 (-0.355 - 0.858)	0.403
Aware	-0.112 (-0.490 - 0.265)	0.546	0.086 (-0.412 - 0.584)	0.727
Objective knowledge	-0.045 (-0.468 - 0.378)	0.829	0.017 (-0.541 - 0.575)	0.950
<b>Non-Latina patient dyads</b>				
Informed	0.115 (0.048 - 0.183)	0.001	-0.006 (-0.077 - 0.066)	0.876
Involved	-0.033 (-0.100 - 0.035)	0.343	0.002 (-0.070 - 0.074)	0.959
Aware	0.038 (-0.030 - 0.107)	0.271	0.138 (0.065 - 0.210)	<0.001
Objective knowledge	-0.006 (-0.069 - 0.058)	0.860	0.059 (-0.009 - 0.126)	0.089

**Table 3. Multivariable-adjusted mean differences in DSP-reported SDQ and treatment deliberation for each of the 4 DSP-reported engagement measures, stratified by DSP type.** \*Mean difference from a multivariable model with standardized scales with a standard deviation of 1.0. Latina/Non-Latinx analysis includes White/Asian/Black/Other. Non-Latina dyads includes all dyads for non-Latina patients.

## Figures



**Figure 1**

**Patient and DSP study populations.**

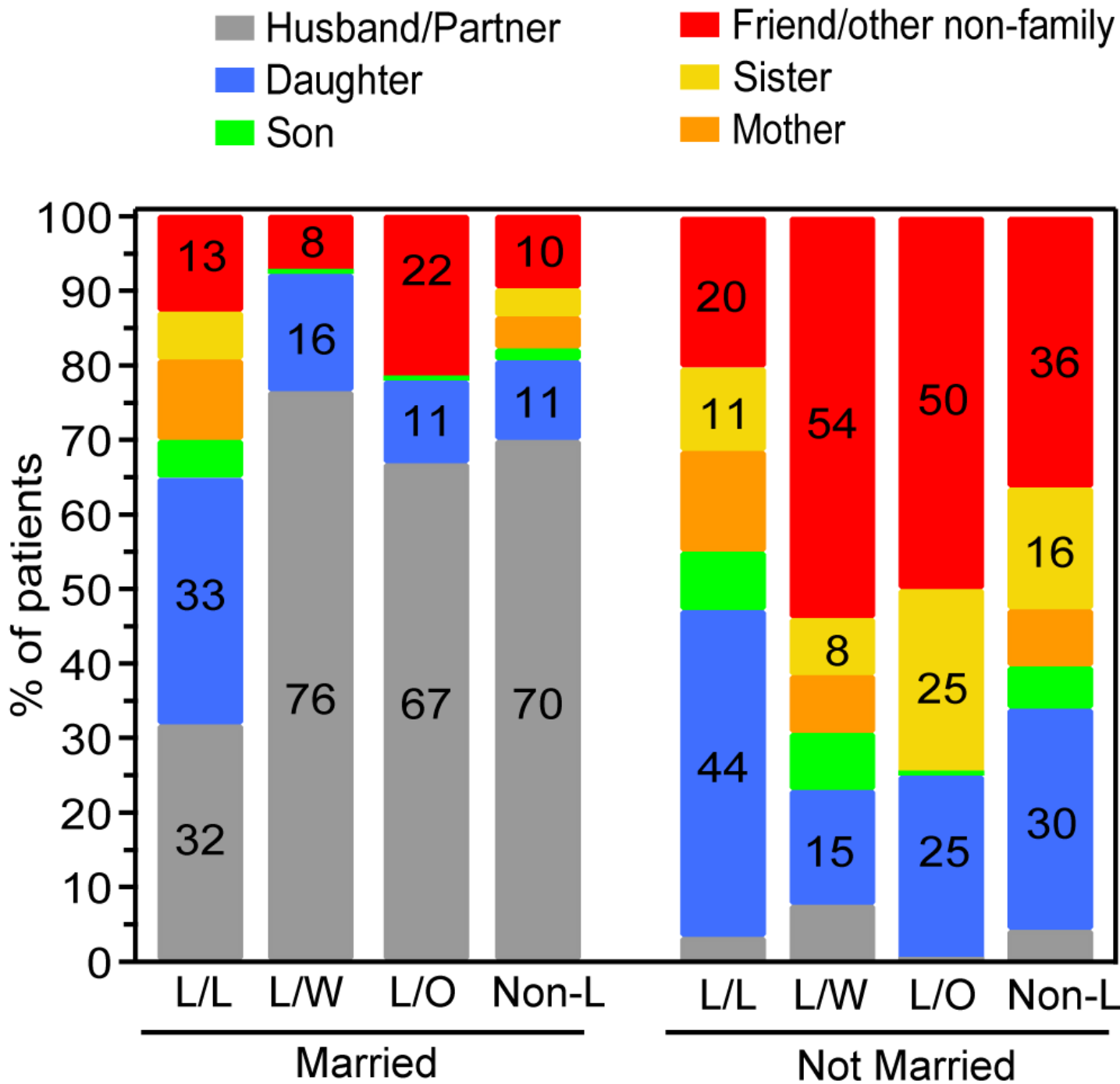


Figure 2

DSP type among the dyad types, stratified by patient married/partnered status. Dyads abbreviations are as follow: Latina/Latinx (L/L), Latina/White (L/W), Latina/[Asian/Black/Other] (L/O), and Non-Latina (Non-L). For clarity, percentages within bars are only shown for the top 3 DSP types. See Table S1 for further details.

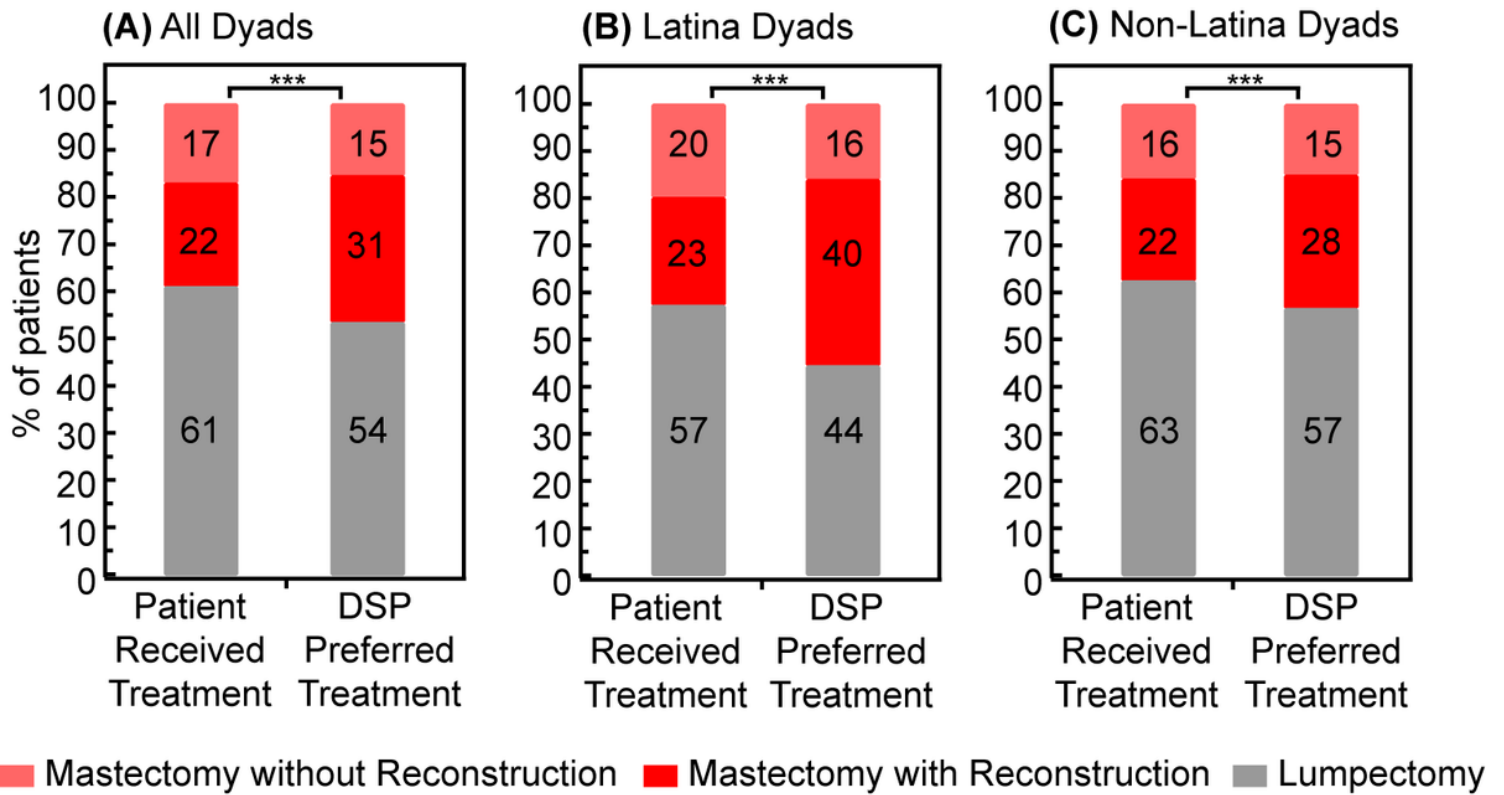


Figure 3

Distributions of DSP preferred treatment and patient received treatment by dyad type. \*\*\* correspond to  $p < 0.001$ .