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ORIGINAL RESEARCH

The Cure SMA Clinical Trial Experience Survey: A Study of Trial Participant Perspectives on Clinical Trial Management and Patient-Centric Management Practices

Ilse S. Peterson · Allison J. Mazzella · Lisa T. Belter · Mary A. Curry · Rosángel E. Cruz · Jill Jarecki

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ABSTRACT

Introduction: Understanding clinical trial experiences can illuminate opportunities to optimize trial design and management, with potential benefits for recruitment and retention. This study sought to better understand clinical trial participant experiences and attitudes within spinal muscular atrophy (SMA), and how the evolving treatment landscape and participant characteristics may predict attitudes.

Methods: A survey was developed following a review of published literature and discussions with caregivers of SMA trial participants. This was distributed via email to known trial participants in Cure SMA's database, announcements in Cure SMA's newsletter, and emails to SMA clinical trial principal investigators.

Results: Seventy complete surveys reflecting unique clinical trial experiences were included in analysis. Responses revealed positive attitudes about clinical trial management overall. Top motivators for trial participation included clinical benefit, investigational drug access, and the opportunity to help others. Top concerns were safety, whether benefits would justify risks, and concerns about pain accompanying tests. The greatest stressors were fear of pain, adverse event concerns, and challenges managing medical complications of SMA. Top benefits of trial participation were hope for a better future, helping others, and relationships with the study team. In regression analysis, participant gender, age, and race all emerged as significant predictors ($p < 0.05$) of motivators, concerns, stressors, and benefits, as did respondent type, knowledge about SMA, distance to the trial site, and treatment era. Top recommendations for improving study management all related to receiving more information.

Conclusion: This research provides new perspective on patient experiences in SMA clinical trials. It underscores the importance of information and efforts to anticipate and accommodate participant needs. These findings may inform study design and interactions with research participants. They may become especially important in supporting recruitment and retention as more treatment options become available.

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I. S. Peterson
Faegre Drinker Consulting, Washington, DC, USA

A. J. Mazzella · L. T. Belter · M. A. Curry (✉) · R. E. Cruz · J. Jarecki
Cure SMA, Chicago, IL, USA
e-mail: mary.curry@curesma.org

PLAIN LANGUAGE SUMMARY

Clinical trials can be stressful experiences for patients and their caregivers, especially when participants are affected by serious diseases. By understanding trial participants' attitudes and experiences, researchers may be better able to accommodate their interests when designing and conducting research studies. This study sought insight into attitudes and experiences of spinal muscular atrophy (SMA) clinical trial participants by surveying people who participated in SMA clinical trials in the USA. The data used in analysis reflected 70 unique clinical trial experiences. Survey responses revealed positive attitudes about clinical trial management overall. Top motivators for trial participation included clinical benefit, investigational drug access, and the opportunity to help others. Top concerns were safety, whether benefits would justify risks, and concerns about pain accompanying tests. The greatest stressors were fear of pain, adverse event concerns, and challenges managing medical complications of SMA. Top benefits of trial participation were hope for a better future, helping others, and relationships with the study team. Whether or not specific motivators, concerns, stressors, and benefits were important was predicted by participant gender, age, and race, as well as respondent type (participant or caregiver), knowledge about SMA, distance to the trial site, and treatment era. Top recommendations for improving study management all related to receiving more information. This research provides new perspective on patient experiences in SMA clinical trials, and may be used to inform future study design and interactions with research participants.

Keywords: Clinical trial experience; Patient attitudes; Patient experience; Spinal muscular atrophy

Key Summary Points

Why carry out this study?

Clinical trials can be stressful experiences for patients and their caregivers, especially when participants are affected by serious diseases such as spinal muscular atrophy. By understanding trial participants' attitudes and experiences, researchers may be better able to accommodate their interests when designing and conducting research studies.

This study sought to better understand clinical trial participant experiences and attitudes within spinal muscular atrophy (SMA), and how the evolving treatment landscape and participant characteristics may predict attitudes.

What was learned from the study?

This research found that many different factors motivate SMA-affected individuals to participate in clinical research, and cause concerns about research participation. It also found that the survey participants saw many benefits to clinical trial participation beyond clinical benefit, including hope for a better future, the opportunity to help others, and positive relationships with study teams.

This research provides new perspective on patient experiences in SMA clinical trials. It underscores the importance of information and efforts to anticipate and accommodate participant needs. These findings may inform study design and interactions with research participants.

INTRODUCTION

The focus on patient centricity in clinical trials has expanded dramatically in recent years. Changes encompass the development and

adoption of new outcome measures, clinical research organization (CRO) concierge services, adaptations to informed consent processes to promote better communication and understanding, introduction of Patient Focused Drug Development meetings by the US Food and Drug Administration, and the emergence of new tools to evaluate individual patient experiences [1–4]. Nevertheless, relatively little scholarly research has been published on patient experiences with trial management. Because clinical trial participants face a series of stressors, patient-focused trial management practices may be an efficient way to mitigate participants' stress and facilitate recruitment and retention [5].[1]

Patient-centric clinical trial practices may be especially impactful for spinal muscular atrophy (SMA). SMA is an autosomal recessive neuromuscular disease characterized by motor neuron loss leading to progressive muscle weakness [6]; 95% of cases are caused by a lack of survival motor neuron (SMN) protein due to the homozygous exon 7 deletion of the *SMN1* gene, with minimal functional protein produced by the pseudogene *SMN2* [6, 7]. Although rare—with an estimated incidence in newborns of 1: 10,000—it is one of the most common genetic causes of death in infants [8–10]. The disease has been traditionally classified into types (0, I, II, III, and IV) based on age of symptom onset and disease severity. Type I is most common [6, 11–13]. There is a correlation between an increased number of *SMN2* copies and decreased disease severity [7]. As a result of changes in disease progression associated with treatment advancements in recent years, SMA is increasingly being classified by markers such as *SMN2* copy number, maximum motor function level, and anticipated SMA type without intervention [14].

The potential severity of SMA and the fact that most SMA trials to date have targeted pediatric populations can make them particularly intensive and stressful. These stresses can be compounded by fears about the diagnosis, disease progression, and complications; the disease burden; and social, emotional, and financial pressures [15–18]. SMA is also an area with unique potential for examining past clinical trial experiences and improving future experiences. There are three FDA-approved treatments for SMA—including an antisense oligonucleotide, a gene therapy, and a small-molecule treatment [19–21]—and more on the horizon. Gaining greater insight into trial participants' experiences and preferences may allow sponsors and sites to identify more patient-centric approaches to trial management.

The Cure SMA Clinical Trial Experience Survey—conducted in conjunction with the Cure SMA Clinical Trial Readiness Program [22]—sought to identify methods for optimizing trial management in SMA, to ultimately improve participants' experiences. This survey evaluated motivations for trial participation, participant and caregiver expectations and experiences, and how trial management and logistics, communication, and stressors impact expectations and experiences. Finally, it sought to identify opportunities for clinical trial sites and sponsors to optimize future clinical trial experiences.

METHODS

Landscape Review

Prior to developing the survey used in this research, the authors used Google Scholar and Google to screen peer-reviewed and gray literature for research on clinical trial experiences, and existing survey tools that might be appropriate for this study. Scholarly publications were found to focus primarily on specific elements of clinical trials such as recruitment and informed consent [5, 24–31]. Several also addressed participants' motivators, concerns, stressors, and benefits [25, 32–34]. Many studies were based upon focus groups and surveys with relatively small sample sizes. Trade publications and blogs tended to have a more holistic focus in line with this research [35–37]. Few references pertaining specifically to pediatric neuromuscular clinical trials were found and no fit-for-purpose tools were identified.

[1] In a survey of 3150 trial participants across multiple disease areas, more than one-fifth found the experience somewhat or very stressful [34]. Pediatric clinical trials may be especially stressful, and raise unique ethical and safety concerns [23].

This literature screen was complemented by discussions with parents and caregivers of SMA trial participants, which illuminated disease-specific nuances of the clinical trial process. These conversations provided context for challenges relating to trial enrollment and participation, and affirmed the authors' perceptions that families involved in pediatric SMA trials face significant stress (J. Horton, A. Medina, D. Schaefer, personal communications, May 2019). They also reinforced the importance of relationships with research coordinators and principal investigators (PIs) to families (J. Horton, A. Medina, D. Schaefer, personal communications, May 2019).

Survey Design

Using insights from the literature screen and discussions with trial participants' caregivers, the researchers developed a survey (see supplementary material) to assess clinical trial experiences of SMA-affected individuals and their caregivers. This survey encompassed experiences with recruitment and enrollment, research visits, and study teams. It was reviewed by Cure SMA's survey team and experienced SMA clinical trial coordinators and PIs to confirm relevance and accessibility. Eligible respondents included all SMA-affected adults who had participated or were participating in an SMA clinical trial and parents and caregivers who cared for a child involved in a trial. Western IRB provided a waiver of IRB review following submission of the study protocol for determination of the necessity of IRB review. All subjects provided consent to participate in the study, and all individuals who are identified in the manuscript provided permission to be identified.

The survey was housed on Survey Monkey and distributed via email to known clinical trial participants in Cure SMA's patient-reported database and SMA clinical trial PIs. Cure SMA's patient-reported database is the largest SMA database, with over 9000 SMA-affected individuals [38]. Targeted emails were sent to 294 email addresses of known trial participants and their caregivers in this database and otherwise known to Cure SMA, as well as all SMA clinical trial PIs identified on ClinicalTrials.gov. Recruitment announcements were also included in Cure SMA's research newsletter, which was sent to 5263 individuals from the Cure SMA database. The survey was open from November 15, 2019 to January 10, 2020.

Analysis

Ninety-one complete survey responses were submitted. Four were excluded from all analysis because they represented duplicate surveys, one was excluded because the respondent was a minor, and eight were excluded because the clinical sites listed were not US trials sites. Of the remaining 78 eligible responses, six came from mother–father pairs and two came from parent–child pairs who responded about the same trial experience. One survey from each of these pairs was excluded from group analysis, so that each trial experience would only be reflected once. For parent–child pairs, surveys from the child (the affected individual) were retained. For mother–father pairs, whichever survey was more complete was retained. Ultimately, 70 surveys reflecting 70 unique experiences were included in group analysis.

Survey Monkey was used for sample characterization and descriptive analysis. Stata SE/15.1 and Stata 16.1/SE were used for statistical tests and regression analyses. Chi-square tests were used to evaluate the characteristics of the sample relative to all known clinical trial participants in the Cure SMA patient-reported database ($n = 311$) as well as the total database population ($n = 8234$). Relationship between SMA type and motor function was assessed because SMA-affected individuals who have been treated with FDA-approved therapies are developing motor functions atypical for their expected SMA type. A chi-square independence test and a Cramér's V test were used to test the association between SMA type and maximum motor function at time of enrollment, and Cramér's V demonstrated an association (Cramer's $V = 0.68$) but the results were still statistically significantly different ($p < 0.001$). Motor function was used in subsequent analyses.

Table 1 Characteristics of analytic sample included in group analysis ($N = 70$)

Demographic characteristics		*n*	%	SMA-related characteristics		*n*	%
Respondent	Self	20	28.6	SMA type	Type I	25	35.7
	Caregiver	50	71.4		Type II	25	35.7
Gender	Male	35	50.0		Type III	19	27.1
	Female	35	50.0		Unknown	1	1.4
Ethnicity	White	53	77.9	*SMN2* copy number	2 copies	30	42.9
	Hispanic/Latino	9	13.2		3 copies	22	31.4
	Asian/Pacific Islander	3	4.4		4 or more copies	12	17.1
	Other	3	4.4		Unknown	6	8.6
Respondent education	No Bachelor's or Master's	15	21.4	Age at diagnosis	Prenatally	8	11.4
	Bachelor's	34	48.6		Within the first month of life	1	1.4
	Master's or greater	21	30.0		Between 1 and 6 months	18	25.7
Trial-related information		*n*	%		Between 7 and 12 months	7	10.0
Treatment era	Pre-treatment (to Dec. 2016)	41	58.6		Between 1 and 5 years	28	40.0
	Treatment era (after Dec. 2016)	29	41.4		Between 6 and 17 years	6	8.6
Current trial participant	Yes	34	48.6		18 or older	2	2.9
	No, withdrawn	20	28.6	Maximum motor function at enrollment	Non-sitter	31	44.3
	No, participation terminated	1	1.4		Sitter	27	38.6
	No, complete	1	1.4		Walker	11	15.7
	No, initial trial complete but in extension or open-label trial	14	20.0		Did not remember	1	1.4
Trial sites	# represented	20					

Logistic regressions were used to determine whether specific factors were perceived as motivators, concerns, benefits, or stressors.

RESULTS

For brevity, numerical data associated with the following text is presented in tables and supplementary material.

Sample Characteristics

Detailed information about the study sample is included in Table 1. Compared with the population of known clinical trial participants in Cure SMA's database, the sample was similar in terms of sex, race/ethnicity, and SMA type (see supplementary material). It underrepresented deceased individuals, had a different

distribution of SMN copy numbers, and reflected earlier diagnoses of SMA. Additionally, the sample only represented individuals at trial sites in the USA.

Overall Perspectives on Study Management and Trial Experiences

Respondents reported positive experiences with study management (Table 2). Most had sufficient information and opportunities to ask questions prior to enrollment, thought study visits well-managed, and reported that their needs were considered in scheduling. Additionally, the methods of communication that were used were generally consistent with respondent preferences (see supplementary material). Respondents had very positive perceptions of research coordinators (CRCs) and PIs, with average rankings for levels of understanding, responsiveness, and trustworthiness falling between "very" and "extremely." Conflicts with work and school and time required for travel were the most common issues reported.

Motivators and Benefits Associated with Participation

Several factors motivated respondents to participate in trials and were seen as benefits of participation (Table 3). All but one motivator had at least one significant predictor. Access to the study drug and clinical benefit and improved quality of life were the only benefits for which regression models output results because of collinearity, but both had significant predictors.

Concerns and Stressors Associated with Participation

Concerns and stressors are presented in Table 4. Fewer concerns and stressors than motivators and benefits had significant predictors.

Opportunities to Reduce Stress and Improve Clinical Trial Experiences

The most significant reported stress reducers were trust in study teams, followed closely by understanding expressed by the study team, witnessing improvements, and study team responsiveness (Table 5). The most frequently recommended ways to improve trial experiences all involved receiving more information (Table 6).

DISCUSSION

While certain aspects of patient experiences in clinical trials such as informed consent have been studied at length, few studies have looked as holistically at clinical trial experiences, and no known research has focused specifically on clinical trial experiences in SMA. This study provides new perspective on attitudes

Table 2 Perspectives on clinical trial management overall

Overall, how did you feel about your experience with each of these aspects of the clinical trial?	*n*	Response (%)					Weighted average
		Very negative	Negative	Neutral	Positive	Very positive	
Communication with study team	70	0.0	1.5	7.1	35.7	55.7	4.46
Screening and enrollment	69	1.5	4.4	11.6	47.8	34.8	4.10
Trial logistics	69	0.0	2.9	20.3	43.5	33.3	4.07
Finding information about the trial	69	1.5	1.5	18.8	50.7	27.5	4.01

Table 3 Motivators and benefits associated with SMA clinical trial participation

Question	*n*	Reported significance (% of responses)			Weighted average	Predictors ($p < 0.05$)*
		Not	Moderately	Significant		
How significant were the following factors in your decision to pursue participation in the trial?						
Desire for clinical benefit and improved quality of life	69	0.0	7.3	92.8	2.93	**
Access to investigational drug	70	12.9	15.7	71.4	2.59	Male (++)
Opportunity to help others with SMA	69	8.7	29.0	62.3	2.54	Distance (+)
Positive interactions with the study team	69	14.5	34.8	50.7	2.36	Knowledge (+)
Access to medical experts	70	18.6	32.9	48.6	2.30	self (−−), male (++), distance (+)
Opportunity to contribute to science	69	17.4	37.7	44.9	2.28	
Support from your doctor	70	25.7	28.6	45.7	2.20	Self (++), age (−), distance (−)
What benefits have come from participation in this trial, and how significant have they been?						
Hope for a better future	68	1.5	13.2	85.3	2.83	**
Opportunity to help others with SMA	70	4.3	25.7	70.0	2.66	**
Positive relationships with the study team	69	4.4	21.7	73.9	2.69	**
Access to study drug	68	13.2	13.2	73.5	2.60	**
Clinical benefit and improved quality of life	69	11.6	17.4	71.0	2.59	**
Access to medical experts	70	4.3	30.0	65.7	2.61	**
Opportunity to contribute to science	70	5.7	37.1	57.1	2.51	**

*In logistic regression analyses with robust standard errors, where the outcome variables were reduced to bivariate yes/no variables and control variables included: respondent type (self vs. caregiver); participant age at enrollment; participant gender; race (vs. white); treatment era (treatment vs. pre-treatment); a score for self-reported knowledge of SMA, SMA clinical trials, and the clinical trials process; motor function (vs. non-sitter); and distance to the trial site

+ denotes odds ratio (OR) > 1.0; ++ denotes OR > 2.0; − denotes OR < 1.0; −− denotes OR < 0.5

**No best-fit models because of collinearity

surrounding trial participation as well as preferences surrounding logistics and communication. Understanding these factors can inform how study staff, sponsors, and CROs approach clinical trials. This information may inform development of materials about clinical trials in general, whether by sponsors, study sites, or patient advocacy groups; development of study protocols by the sponsor; development of informational materials about studies by the sponsor; how and what study staff communicate; services offered by CROs; and how sites

Table 4 Concerns and stressors associated with SMA clinical trial participation

Question	*n*	Reported significance (% of responses)			Weighted average	Predictors ($p < 0.05$)*
		Not	Moderately	Significant		
Did any of the following factors cause concern about participation?						
Uncertainty about the safety of the study drug	69	23.2	52.2	24.6	2.01	
Uncertainty about whether potential benefits would justify potential risks	69	27.5	46.4	26.1	1.96	
Fear of physical and/or mental pain that could accompany required tests	69	33.3	42.0	24.6	1.91	
Travel required for study	70	50.0	31.4	18.6	1.69	Age (+)
Time required for study	70	52.9	34.3	12.9	1.60	
Complexity of the study logistics	69	55.1	40.6	4.4	1.49	
Concern about loss of control	70	57.1	30.0	12.9	1.56	Person of color (++)
Long-term commitment required	70	64.3	25.7	10.0	1.46	
Were any of the following sources of stress during the trial?						
Fear of physical and/or mental pain that could accompany required tests	69	33.3	40.6	26.1	1.93	Treatment era (−−)
Concern about potential adverse events	69	26.1	56.5	17.4	1.91	
Challenges managing SMA-related medical complications	69	43.5	37.7	18.8	1.75	
Travel required for study	70	42.9	44.3	12.9	1.70	Self (−−), distance (+)
Time required for study	70	42.9	48.6	8.6	1.66	
Challenges balancing daily life with study requirements	69	53.6	36.2	10.1	1.56	
Long-term commitment required	70	68.6	24.3	7.1	1.39	Self (−−), age (+)
Complexity of the study logistics	70	68.6	28.6	2.9	1.34	
Feeling a loss of control	70	74.3	15.7	10.0	1.36	

*In logistic regression analyses with robust standard errors, where the outcome variables were reduced to bivariate yes/no variables and control variables included: respondent type (self vs. caregiver); participant age at enrollment; participant gender; race (white/not); treatment era (treatment vs. pre-treatment); a score for self-reported knowledge of SMA, SMA clinical trials, and the clinical trials process; motor function, and distance to the trial site

+ denotes odds ratio (OR) > 1.0; ++ denotes OR > 2.0; − denotes OR < 1.0; −− denotes OR < 0.5

Table 5 Factors that reduced participant stress during SMA clinical trials

Did any of the following help to reduce your stress during the trial?	*n*	Response (%)			Weighted average
		Did not help	Moderately	Significantly	
Understanding expressed by your study team	68	1.5	20.6	77.9	2.76
Trust in your study team	69	4.4	15.9	79.7	2.75
Responsiveness of your study team	68	1.5	29.4	69.1	2.68
Witnessing improvements in me/my child(ren) during the trial	69	7.3	18.8	73.9	2.67
Receiving thorough, timely updates	67	10.5	47.8	41.8	2.31
Effective coordination between your study team and PCP	67	20.9	29.9	49.3	2.28

and CROs monitor patient experiences during trials.

Insights from this research may facilitate more personalized approaches to interaction with trial participants. The findings illustrate the many motivators and concerns beyond clinical benefit and risk that inform decisions about trial participation, and their relative importance to the SMA community. Together, they show how—perhaps not surprisingly—motivators are weighted more heavily than concerns. This research also provides new, nuanced perspective on predictors of specific motivators, concerns, stressors, and benefits, such as gender, age, race, and distance to the trial site. One noteworthy finding is that people of color were significantly more likely to report concerns about loss of control in trials than people who were white. This is relevant to current efforts to expand access to care and research for people of color.

This research also suggests that providing ample information to current and prospective trial participants, building trusting relationships, and accommodating logistical and communication preferences all hold potential for optimizing trial experiences. Sponsors, sites, and patient advocacy groups can all play roles in ensuring that such information is available and presented in an accessible way. While study teams play the lead role in developing trusting relationships, sponsors and patient groups may also help in determining what is needed to build trust. Lastly, stakeholders can collectively work to understand and accommodate logistical preferences through protocol development, site selection, visit scheduling, and joint exploration mechanisms that reduce travel, such as telemedicine and satellite site models.

Finally, the desire for information reflected in respondents' answers provides justification for investment in patient education initiatives focused on SMA, SMA and rare pediatric disease clinical trials, and what is involved in clinical trial participation. Such initiatives may be carried out by patient advocacy groups, healthcare organizations, and sponsors of clinical research. These findings may also provide justification for the training of healthcare professionals and study staff in effective communication techniques and methods for building trust. Such efforts may be especially beneficial in situations where recruitment poses a challenge.

Limitations

This study has several limitations. First, multiple forms of selection bias are present. Sampling bias is a concern because large numbers of responses were received from a limited number of trial sites. To evaluate the degree to which this was likely to be an issue, proportions of patients from sites represented in the study were compared with a clinical trial site recruitment model published in 2020, which looked at

recruitment targets for sites participating in trials between 2011 and 2018. This analysis suggested that the proportional representation of sites in our survey was reasonably consistent with sites represented in SMA clinical trials during the time period captured in our survey. We also assessed how the characteristics of our study sample compared with the total population of known trial participants in Cure SMA's database, and the total population in the database. Selection bias also arises from the expectation that survey respondents may be more highly engaged—and perhaps have different characteristics—than the average trial participant, limiting generalizability. Finally, participants who were on placebo and did not see as significant benefits due to later treatment may have been a source of potential nonresponse bias.

Bias may have also affected participants' responses. First, as a retrospective survey with self-reported answers, this is inherently subject to recall bias. Second, social desirability bias is a concern, and may have led participants to alter their responses and not report information perceived as critical or negative. Lastly, response bias and response-shift bias are concerns, as treatment assignment and outcomes could have changed a participant's frame of reference. Because the survey did not collect information about trial phase or treatment assignment, this could not be controlled for. This is important because it is anticipated that the perspectives of those randomized to placebo arms may be different from those in treatment arms.

More generally, it is worth noting that this study reflects perspectives at one specific point in time, and that changes in the SMA treatment landscape and the healthcare ecosystem may alter attitudes and what might have been observed had this study been conducted at another time. For example, shifts in the SMA treatment landscape and the availability of new drugs may affect attitudes about investigational drugs. In addition, the expanded focus on telemedicine that has arisen in the context of the COVID-19 pandemic could change attitudes about logistical aspects of trials, such as travel. Other changes are also likely, and will be borne out over time.

The Uniqueness of SMA & Areas for Future Exploration

The degree of success that has been experienced in SMA drug development is relatively unique, as is the level of engagement within the community. Recruitment to SMA trials has been very efficient given its orphan status, and the approval of three new drugs by the FDA in less than 4 years is uncommon for rare diseases.[2] The positive results of several recent clinical trials in SMA may have contributed to the positive perceptions observed in this study.

In future research, it would be worthwhile to explore the degree to which the practices discussed within this article facilitate recruitment and retention in clinical research. Given the severity of SMA and the limited number of treatment options available when this survey was administered, it is possible that trial management may not have affected participant choices as significantly as it would have if individuals had access to more treatment options. However, these practices may become increasingly relevant in the future, as options increase. Given the key role that study teams appear to play in buffering stress, there may be value in studying the effectiveness of mechanisms (e.g., training) intended to improve patient experiences by helping members of study teams effectively demonstrate understanding, build trust, and respond to participant needs. Exploring the specific information that patients want regarding SMA, SMA clinical trials, and what is involved in clinical trial participation would also be valuable, as would examining how this information influences decision-making. While this study asked for self-reported knowledge levels in these areas, it did not delve into detail about what information within these categories respondents possessed or desired. Repeating the study in a

[2] By comparison, cystic fibrosis was added to the Recommended Uniform Screening Panel (RUSP) for universal newborn screening in 2006—when one drug was in clinical trials—and it took more than a decade for multiple drugs to be approved [39]. Pompe had its first drug approved in 2006 and was added to the RUSP in 2015, and it has taken more than 20 years to have multiple drugs approved with newborn screening [40].

Table 6 Opportunities to improve experiences, communication, and trust in clinical trials

Questions*	*n* selected
Would any of the factors below have significantly improved your experience with recruitment and enrollment?	
More written materials about the trial(s) being considered	16
More discussion of trial options with principal investigator(s)	13
More materials written in laymen's terms	12
More discussion of trial options with my primary care provider	12
Receiving study information further ahead of my screening visit	11
More opportunity to discuss the study and informed consent process specifically	6
More written materials about the informed consent process	3
Would any of the following have significantly improved your experience during the trial?	
Timely updates on trial results as they are released	22
Having visit schedules well in advance of research visits	17
Efforts to accommodate your availability when scheduling research visits	18
Timely, current information on adverse events	15
Reordering procedures to reduce fatigue	10
More breaks to reduce fatigue	8
Materials explaining trial instructions in layman's terms	7
Greater contingency planning	9
Improving transitions between procedures	4
Do you have any suggestions for how clinical trial sites and sponsors could strengthen communication and trust?	
More information regarding tests and the "why" behind testing	18
Greater effort to understand my experience as a person affected by SMA	15
More frequent communication and check-ins	16
Use of layman's terms instead of medical jargon	9
Greater responsiveness to needs	8

*Participants were asked to check all that apply

population that had negative experiences (i.e., explicitly recruiting individuals who were dissatisfied to complete the same survey) and studying the perspectives of individuals who elected not to participate in clinical research would provide insight that could complement this research. Finally, data from this study could potentially be utilized to inform development of measures for assessing patient satisfaction in trials.

CONCLUSIONS

In addition to providing insights that can inform SMA research, this study may have relevance for other disease communities. Given

the nature of SMA and that most respondents were parents or individuals who had participated in pediatric clinical trials, the findings may have the greatest relevance for other pediatric clinical research, particularly in rare and serious diseases, where there is little information available about the disease and little experience with trials, and where optimizing management practices may help overcome recruitment and retention challenges. Other factors may also affect relevance, including whether diseases are life-threatening and whether treatment options are available.

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Authorship. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole, and have given their approval for this version to be published.

Author Contributions. Ilse Peterson and Allison Mazzella conducted literature research, designed and coordinated dissemination of the survey that was used for this work, and cleaned the survey data. Ilse Peterson and Lisa Belter analyzed the survey data. Ilse Peterson, Allison Mazzella, and Lisa Belter. Rosángel Cruz, Jill Jarecki, Lisa Belter, and Mary Curry provided strategic guidance for survey development, dissemination, and analysis and assisted with review and editing of the manuscript. No medical writers were used for this work.

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Compliance with Ethics Guidelines. Western IRB provided a waiver of IRB review following submission of the study protocol for determination of the necessity of IRB review. All subjects provided consent to participate in the study, and all individuals who are identified in the manuscript provided permission to be identified.

Data Availability. The datasets generated during and/or analyzed during the current study are not publicly available due to a commitment in the study consent form to only publish data in aggregated formats, given concerns about confidentiality associated with the

relatively small size of this patient population and clinical trial population.

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