

Therapists' Use of the Graded Repetitive Arm Supplementary Program (GRASP) Intervention: A Practice Implementation Survey Study

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Background. Only a small percentage of research is ever successfully translated into practice. The Graded Repetitive Arm Supplementary Program (GRASP) is a stroke rehabilitation intervention that anecdotally has had rapid translation from research to clinical practice. This study was conducted to explore the characteristics of this practice implementation.

Objectives. The aims of this study were: (1) to explore the extent of practice implementation of GRASP in the United Kingdom; (2) using an implementation framework, to explore UK therapists' opinions of implementing GRASP; and (3) if GRASP is found to be used in the United Kingdom, to investigate differences in opinions between therapists who are using GRASP in practice and those who are not.

Design. A cross-sectional study design was used.

Methods. Data were collected via an online questionnaire. Participants in this study were members of the College of Occupational Therapy Specialist Section Neurological Practice and the Association of Chartered Physiotherapists Interested in Neurology.

Results. Of the 274 therapists who responded to the survey, 61 (22.3%) had experience of using GRASP, 114 (41.6%) knew of GRASP but had never used it, and 99 (36.1%) had never heard of GRASP. Therapists displayed positive opinions toward the implementation of a manual with graded progressions of structured upper limb exercises for people after stroke. Opinions were different between therapists who had used GRASP and those who had not.

Limitations. The findings of this study may be limited by response bias.

Conclusions. GRASP is a relatively new stroke rehabilitation intervention that has made impressive translation into the knowledge and practice of UK therapists. Therapists' opinions would suggest that GRASP is both an acceptable and feasible intervention and has the potential to be implemented by a greater number of therapists in a range of settings.



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It is increasingly recognized that significant gaps exist between what is *known* to improve health and what is *done* to improve health. The time it takes for research to become incorporated into practice is unacceptably long.¹ There are countless examples where it has taken more than a decade to move from widespread agreement that a change in treatment is required to actual uptake in clinical practice.² This delay results in patients being denied the most effective treatments. For example, despite evidence of not just nonefficacy but also of harm, 50% of American neurologists continued to use intravenous heparin for acute stroke³ 16 years after the original research was published.

Implementation research has been defined as “the scientific study of methods to promote the effective uptake of research findings”⁴ and has emerged as a result of a need for a clear scientific understanding of the factors maintaining current obsolete behavior and the barriers and facilitators to change.⁵ Bridging the research-practice gap should be a priority for all researchers, clinicians, funders, and policy makers.⁶ Existing strategies to facilitate the translation of evidence into clinical practice include the production of best practice guidelines and systematic reviews. However, we now know that simply disseminating these publications after the research has been completed is not enough to initiate and sustain a change in day-to-day practices of clinicians.⁷

Increasing emphasis is being placed on considering implementation at the earliest stages of the development of interventions,⁵ and a range of frameworks now exist that aim to facilitate researchers to consider implementation at all stages of the research process. The Consolidated Framework for Implementation Research (CFIR)⁸ has been proposed

as a comprehensive taxonomy of factors influencing the implementation of research findings. However, one of the biggest critiques of the use of such frameworks is that they appear to be most often used retrospectively.⁹ Should these frameworks be used prospectively, they may assist both researchers and clinicians to pre-empt, or identify, factors that will positively or negatively affect the implementation of best evidence in the future.

An example of an evidence-based intervention developed to facilitate upper limb recovery after stroke, and a clear example of failure to translate a novel intervention into clinical practice, is constraint-induced movement therapy (CIMT). This technique was introduced in 1993,¹⁰ with numerous trials and a meta-analysis confirming its effectiveness.^{11,12} However, widespread clinical implementation of CIMT by therapists remains limited.¹³ In stark contrast to CIMT is the Graded Repetitive Arm Supplementary Program (GRASP), which has its basis in the same principles of increasing the intensity of use of the affected upper limb after stroke. The GRASP inpatient randomized controlled trial was published in 2009,¹⁴ and a recommendation reflecting the results of this trial was included in the updated 2010 Canadian Best Practice Recommendations for Stroke Care (ie, “therapists should provide a graded repetitive arm supplementary program to increase activity on the ward and at home”).^{15(p109)} The GRASP intervention is now in use in more than 20 centers in Canada and in at least 8 countries worldwide.¹⁶ Therefore, anecdotally, GRASP appears to be feasible and acceptable to clinicians, service providers, and patients.

GRASP is a self-directed arm and hand exercise program that is taught and monitored by a therapist but car-

ried out independently by the patient, with the patient’s family if possible. The program is not meant to replace existing therapy services but rather to augment current therapy, adding opportunities for more practice. GRASP was developed by Canadian researchers and consists of 3 levels of manuals with graded progressions of exercises, including range-of-motion and stretching exercises, functional strengthening, weight bearing through the hand, trunk control, repetitive paretic arm practice, and repetitive bilateral arm tasks. Considering the anecdotal rapid implementation of this evidence into practice, there is a unique opportunity to explore this practice implementation (how the intervention is being used by therapists in practice), which occurred without a formal knowledge translation intervention (eg, it has yet to be included in the UK clinical guidelines for stroke). However, to date, the extent of implementation of the program in the United Kingdom has not been investigated. By exploring therapists’ opinions of interventions that have been implemented, it may be possible to identify a model to predict interventions that are more likely to be implemented successfully in the future.

This study had 3 main aims: (1) to explore the extent of practice implementation of GRASP in the United Kingdom, (2) to use the CFIR to explore UK therapists’ opinions of implementing GRASP, and (3) if GRASP is found to be used in the United Kingdom, to investigate differences in opinions between therapists who are using GRASP in practice and those who are not.

Method Study Design

A cross-sectional study design was used, with data collected via an online, self-administered questionnaire.

Participants

The sample population was occupational therapists and physical therapists working with people with stroke in the United Kingdom. These therapists were identified through the College of Occupational Therapy Specialist Section Neurological Practice (COTSSNP) and the Association of Chartered Physiotherapists Interested in Neurology (ACPIN), respectively.

Instrument

A review of the literature was carried out to identify an existing tool with established reliability and validity for use in this study. No suitable data collection tools were identified. Therefore, an original questionnaire was developed using the online software tool SurveyMonkey (SurveyMonkey, Palo Alto, California). The questionnaire consists of 3 sections: (I) demographics, (II) upper limb exercises after stroke, and (III) use of the GRASP. Sections I and III are provided in the Appendix. Findings from section II of the survey instrument will be presented elsewhere. Likert scale statements were developed in line with 2 subdomains of the CFIR (ie, intervention characteristics and characteristics of the therapists). The validity of the questionnaire was established by a panel of therapists and researchers with extensive experience of survey design, GRASP, and implementation science. Prior to disseminating the survey questionnaire, 2 rounds of online pilot testing were carried out with clinicians ($n=5$ and $n=3$), and minor changes were made to the questionnaire based on feedback received.

Procedure

Permission was obtained from ACPIN and COTSSNP to have the survey link e-mailed to their members. Therapists were sent an e-mail from the respective organizations containing the survey link, a brief note outlining

the nature of the research, and an invitation to complete the survey. A follow-up reminder e-mail also was sent 2 weeks later.

Data Analysis

Data were analyzed using PASW Statistics version 20 (IBM Corp, Armonk, New York). Frequency distributions were run to describe, summarize, and demonstrate the distribution of the data. To investigate differences between groups, the dataset was split into therapists who had experience using GRASP and therapists who had no experience using GRASP. Likert scales were coded where a score of 1 represented "strongly agree" and a score of 5 represented "strongly disagree." The Mann-Whitney U test was used to explore differences between 2 independent groups based on the mean rank of each group. The group of therapists who had experience using GRASP was then further split into therapists who regularly use GRASP in practice and therapists who had tried using GRASP on occasion, and the same nonparametric tests were carried out. The Kruskal-Wallis test was used to compare the mean ranks of 3 or more independent groups (eg, work settings). A significance level of $P<.01$ was set. This significance level was deemed to be sufficiently rigorous, as there were 15 related opinion items.

Role of Funding Source

The work presented here is the first phase of a 3-year National Institute for Health Research-funded project that aims to develop a feasible structured upper limb exercise program in UK stroke rehabilitation units. The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the National Health Service or the National Institute for Health Research.

Results

Respondents

The survey link was e-mailed to members of ACPIN who had identified stroke as their main speciality ($n=608$) and to members of COTSSNP ($n=917$) on 2 occasions. As the survey link was sent out by the organizations, it was not possible to identify the exact number of therapists who successfully received the link. In total, 322 therapists responded to the survey, giving an approximate response rate of 21.1%. Of these respondents, 7 therapists were not currently working with people with stroke, and 20 therapists completed only the demographics section of the survey. These responses were excluded, leaving 295 datasets for analysis. From these 295 datasets, 274 therapists continued to section III and completed the survey. The response rate was low but not unexpected for this type of survey.¹⁷ The characteristics of the responding therapists are summarized in Table 1.

As shown in Table 1, 175 (63.9%) therapists were aware of the GRASP intervention, and 99 (36.1%) had never heard of it. Therapists reported encountering GRASP through informal discussions with colleagues ($n=60$, 21.9%), through their own research ($n=55$, 20.1%), through department in-services ($n=18$, 6.6%) and through a talk in the United Kingdom (by J.J.E.) ($n=9$, 3.3%). Sixty-one therapists (22.2%) reported that they had either tried using GRASP in practice on occasion or regularly use GRASP in practice, and of these respondents, 33 were physical therapists and 28 were occupational therapists. GRASP was used most frequently by therapists working in community settings ($n=27$), followed by rehabilitation settings ($n=20$) and acute settings ($n=14$).

Tables 2, 3, 4, and 5 illustrate therapists' responses to the Likert scale

statements in the survey. For presentation purposes only, the 5-point Likert scale has been collapsed into 3 categories, and the percentage responses are shown for “strongly agree/agree,” “neutral,” and “disagree/strongly disagree.” Mean ranks and *P* values were calculated based on the 5-point scale. Tables 2 and 3 illustrate differences in responses between therapists who had experience using GRASP in practice and therapists who had no experience using GRASP in practice. Tables 4 and 5 illustrate differences in responses between therapists who regularly use GRASP and therapists who have tried using GRASP on occasion.

Therapists displayed positive opinions toward the implementation of a manual with graded progressions of structured upper limb exercises, with the majority agreeing that it would be beneficial for the therapist and have positive outcomes for the person with stroke. Nonparametric tests on demographic characteristics of respondents detected significant differences for work setting only. Therapists working in rehabilitation settings were significantly more positive when asked about whether a manual would have positive outcomes for people with stroke ($H_2=11.56$, $P=.003$), the applicability of a manual in stroke rehabilitation ($H_2=9.31$, $P=.009$), and whether it could be easily incorporated into their work setting ($H_2=12.14$, $P=.002$).

Therapists who did not have experience using GRASP in practice agreed that they would be confident in their ability to use manuals but also agreed they would require further training. Significant differences were demonstrated between these 2 groups, with therapists who had experience using GRASP in practice responding more positively toward the use of a manual with graded progressions of upper

Table 1.
Respondent Characteristics (n=274)

Question	Response Categories	Responses	
		n	%
Job title	Physical therapist	148	54.0
	Occupational therapist	126	46.0
NHS job band ^a	Band 5	11	4.0
	Band 6	108	39.4
	Band 7	122	44.5
	Band 8a/8b	24	8.8
	Other	9	3.3
Work setting	Acute care	72	26.3
	Rehabilitation	98	35.8
	Community	99	36.1
	Other	5	1.8
No. of years working with people with stroke	0–2	27	9.9
	3–10	136	49.6
	>10	111	40.5
Familiarity with GRASP ^b	Never heard of GRASP	99	36.1
	Read about GRASP but never used it	72	26.3
	Spoken to colleagues about GRASP but never used it	42	15.3
	Tried using GRASP in practice on occasion	30	10.9
	Regularly use GRASP in practice	31	11.3

^a UK National Health Service job bands: band 5=most junior, band 8a/8b=most senior, generally managerial or clinical specialist.

^b GRASP=Graded Repetitive Arm Supplementary Program.

limb exercises on 13 of the 15 statements.

Significant differences also are shown in Table 4 and Table 5, where therapists who regularly use GRASP in practice responded significantly more positively on 7 of the 15 statements. These therapists agreed more strongly that GRASP is beneficial to the therapist, is applicable to a large proportion of patients with stroke, is easily incorporated in their work setting, and results in more positive outcomes for people with stroke. Two respondents who were regular users of GRASP selected “strongly agree/agree” for the statement “Would be unsafe to use with a stroke population.” No explanation of this selection was given in the open-ended response section. For those therapists who had tried using GRASP on

occasion, factors relating to their organizational context (ie, applicability to large proportion of stroke cases, incorporating the intervention into work setting, printing, and administration; and a culture of continuous improvement) as opposed to the intervention itself were significant.

Discussion

One of the biggest challenges faced by health services researchers in the 21st century is ensuring that the highest levels of available evidence are successfully and consistently implemented into day-to-day clinical practice. GRASP is a relatively new stroke rehabilitation intervention that has made impressive translation into the knowledge and practice of UK therapists. Despite only being published in 2009, and not being

Table 2. Therapists' Responses (%) to the "Intervention Characteristics" Statements (Shown by Therapists Who Had Experience Using GRASP^a and Therapists Who Had No Experience Using GRASP)

Statements	Have Used GRASP (n=61)				Have Not Used GRASP (n=213)				Mean Rank	P ^b
	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree	Mean Rank	Strongly Agree/Agree	Neutral	Disagree/Strongly Disagree	Mean Rank		
Evidence strength and quality:										
The use of upper limb task-specific exercises for people after stroke is well supported by the evidence base	86.9	11.5	1.6	113.40	74.2	17.4	8.5	144.40	.003	
Relative advantage:										
Would be beneficial for a therapist treating people with stroke	96.7	3.3	0.0	104.48	86.4	11.7	1.8	146.96	<.001	
Would have positive outcomes for people with stroke	91.8	6.6	1.6	96.50	66.2	32.4	1.4	149.24	<.001	
Adaptability:										
Would not be applicable to a large proportion of stroke cases	18.1	19.7	62.3	150.03	16.5	36.2	47.4	133.91	.134	
Complexity, quality and packaging, cost:										
Would be too time-consuming to implement in practice	1.6	14.8	83.6	173.54	7.0	31.9	61.0	127.18	<.001	
Would not be suitable in my work setting due to a lack of available equipment	13.1	18.0	68.9	163.95	11.8	42.3	46.0	129.92	.002	
Would be easily incorporated into current practice at my work setting	88.5	8.2	3.3	87.02	46.5	40.8	12.7	151.96	<.001	
Would involve too much printing and administration to be used in my work setting	4.9	13.1	82.0	178.13	9.8	45.1	45.1	125.83	<.001	

^a GRASP = Graded Repetitive Arm Supplementary Program.

^b Boldfaced P values represent significant differences.

explicitly recommended in the UK stroke guidelines, approximately 63% of UK therapists who responded to this survey were aware of GRASP by 2013, of whom 23% have used GRASP and 11% are regular users. These findings contrast with some other rehabilitation interventions, notably CIMT, a tool that is applied as well as structured exercise as opposed to GRASP, which is solely structured exercise. Despite being introduced by Taub et al¹⁰ in 1993 and explicitly recommended in the UK guidelines¹⁸ since 2004, CIMT has had limited adoption into daily practice.¹⁹ It is hard to contrast the findings of this survey directed to CIMT, as a comparable survey regarding practice implementation has not been undertaken; however, clinical acceptability is known to be low.¹⁹⁻²¹

Interestingly, in this study, the way in which therapists reported most frequently encountering GRASP was through informal discussions with colleagues. This finding is reflective of previous research that concluded physical therapists,²² nurses,²³ and rehabilitation therapists²⁴ rely heavily on other people to provide information for decision making and answering questions that arise in practice. This finding also further reinforces the fact that publications summarizing best evidence and conference presentations may not be the most practical and engaging methods of communicating research findings to clinicians; novel dissemination strategies need to be utilized. There may also be a potential role for informal opinion leaders in talking about and modeling an intervention for others to hear about and see,²⁵ particularly as a large proportion of respondents in this survey reported being willing to advocate for the implementation of this intervention in their current work setting.

Table 3. Therapists' Responses (%) to the "Characteristics of Individuals" Statements (Shown by Therapists Who Had Experience Using GRASP^a and Therapists Who Had No Experience Using GRASP)

Statements	Have Used GRASP (n=61)			Have Not Used GRASP (n=213)			Mean Rank	P ^b
	Strongly Agree/ Agree	Neutral	Disagree/ Strongly Disagree	Strongly Agree/ Agree	Neutral	Disagree/ Strongly Disagree		
Knowledge and beliefs:								
Would be unsafe to use with a stroke population	3.3	6.6	90.1	2.8	24.4	72.8	128.43	<.001
Would undermine the role of the therapist in treating people with stroke	0.0	4.9	95.1	4.7	23.0	72.3	127.29	<.001
Self-efficacy:								
I would be confident in my ability to use manuals to deliver structured upper limb exercises to people after stroke	91.8	6.6	1.6	64.3	23.0	12.7	149.18	<.001
I would require further training to use manuals to deliver structured upper limb exercise to people after stroke	13.1	16.4	70.5	39.4	32.4	28.2	124.23	<.001
Individual identification:								
There is a culture of continuous improvement within my current work setting	90.1	3.3	6.5	81.7	13.1	5.1	144.31	.002
Management staff are generally not supportive of therapist-led initiatives	9.8	23.0	67.3	13.6	20.7	65.8	137.42	.974
Other personal attributes:								
I would be willing to advocate for the use of structured upper limb exercise manuals in my current work setting	86.9	13.1	0.0	58.7	36.6	4.7	149.67	<.001

^a GRASP = Graded Repetitive Arm Supplementary Program.
^b Boldfaced P values represent significant differences.

Table 4. Therapists' Responses (%) to the "Intervention Characteristics" Statements (Shown by Therapists Who Regularly Use GRASP^a in Practice and Therapists Who Have Tried Using GRASP on Occasion)

Statements	Regularly Use GRASP (n=31)				Have Tried Using GRASP on Occasion (n=30)				Mean Rank	P ^b
	Strongly Agree/ Agree	Neutral	Disagree/ Strongly Disagree	Mean Rank	Strongly Agree/ Agree	Neutral	Disagree/ Strongly Disagree	Mean Rank		
Evidence strength and quality:										
The use of upper limb task-specific exercises for people after stroke is well supported by the evidence base	90.3	6.5	3.2	28.81	83.4	16.7	0.0	33.27		.274
Relative advantage:										
Would be beneficial for a therapist treating people with stroke	100.0	0.0	0.0	24.71	93.3	6.7	0.0	37.50		.001
Would have positive outcomes for people with stroke	100	0.0	0.0	23.74	83.4	13.3	3.3	38.50		<.001
Adaptability:										
Would not be applicable to a large proportion of stroke cases	6.5	3.2	90.3	39.60	30.0	36.7	33.3	22.12		<.001
Complexity, quality and packaging, cost:										
Would be too time-consuming to implement in practice	0.0	6.5	93.6	34.34	3.3	23.3	73.3	27.55		.096
Would not be suitable in my work setting due to a lack of available equipment	12.9	6.5	80.6	35.40	13.3	30.0	56.7	26.45		.034
Would be easily incorporated into current practice at my work setting	100	0.0	0.0	24.55	76.7	16.7	6.7	37.67		.001
Would involve too much printing and administration to be used in my work setting	0.0	9.7	90.3	36.08	8.0	16.7	73.3	25.75		.006

^a GRASP = Graded Repetitive Arm Supplementary Program.

^b Boldfaced P values represent significant differences.

Conversely, the fact that therapists rely on informal discussions and other people to provide information for their clinical decision making, as opposed to research evidence, is a concern. It should be ensured that only interventions that have a sufficient evidence base are implemented. This suggestion is not as simple as it sounds, as it is not always clear at what point evidence is sufficiently robust to support widespread implementation. Guidelines make recommendations based on the hierarchy of evidence but, where gaps exist, rely on consensus. In reality, research and implementation often overlap and do not occur in a linear progression,⁵ which leaves practice vulnerable to being opinion-based rather than evidence-based and needs to be safeguarded against.

The early adopters²⁶ of GRASP appeared to have some different characteristics compared with those therapists not currently using GRASP. Although it was not surprising that the therapists who use GRASP have higher opinions about its effectiveness (otherwise, we might have expected them to discontinue it), it is important to note that these early adopters agreed more strongly that they have a culture of continuous improvement in their work setting. Equally, these therapists displayed more positive opinions on subdomains of the CFIR relating to the relative advantage of the intervention. This finding is interesting, as a recent study evaluating the implementation of a weight management program²⁷ showed the perceived relative advantage of the intervention to be a strongly distinguishing construct between those sites that implemented the intervention and those that did not.

When considering the challenges of translating effective interventions into practice, there is also the very real concern that therapists choose

not to implement interventions because they threaten the therapists' autonomy.²⁸ Due to the structured nature of the GRASP manuals, and as they advocate a self-management approach, there is potential for therapists to feel their clinical role and autonomy in clinical decision making are compromised. Collectively, therapists in this study disagreed that a manual with graded progressions of upper limb exercises would undermine the role of the therapist. However, a number of therapists expressed concern that this intervention is a "one size fits all" approach to stroke rehabilitation. Interestingly, those therapists who had experience using GRASP and those who used GRASP regularly disagreed significantly more that this intervention would undermine the role of the therapist.

The use of a structured framework to evaluate opinions toward implementation challenges is one of the strengths of this study and will facilitate cross-comparisons among future similar studies. A limitation of this study was the use of a data collection tool that was self-administered and completed voluntarily. This method allows for a self-selection bias, where individuals with strong opinions or personal interest in upper limb exercises after stroke are perhaps over-represented in the study findings as opposed to individuals who are indifferent to the topic and less likely to respond. The study also solicited responses only from therapists who were members of the professional organizations, and it is not known what percentage of therapists these responses represent. The findings in this study may be limited by a response bias, where therapists responding to the survey answer questions favorably and thus the findings may not be a completely accurate reflection of therapists' opinions. Feedback in open responses highlighted that therapists who had

Table 5. Therapists' Responses (%) to the "Characteristics of Individuals" Statements (Shown by Therapists Who Regularly Use GRASP^a in Practice and Therapists Who Have Tried Using GRASP on Occasion)

Statements	Regularly Use GRASP (n=31)			Have Tried Using GRASP on Occasion (n=30)			Mean Rank	p ^b
	Strongly Agree/ Agree	Neutral	Disagree/ Strongly Disagree	Strongly Agree/ Agree	Neutral	Disagree/ Strongly Disagree		
Knowledge and beliefs:								
Would be unsafe to use with a stroke population	6.5	0.0	93.6	0.0	13.3	86.7	29.17	364
Would undermine the role of the therapist in treating people with stroke	0.0	3.2	96.8	0.0	6.7	93.3	24.07	.001
Self-efficacy:								
I would be confident in my ability to use manuals to deliver structured upper limb exercises to people after stroke	90.4	9.7	0.0	93.3	3.3	3.3	35.25	.032
I would require further training to use manuals to deliver structured upper limb exercise to people after stroke	9.7	12.9	77.4	16.7	20.0	63.6	27.68	.094
Individual identification:								
There is a culture of continuous improvement within my current work setting	96.8	0.0	3.2	83.4	6.7	10.0	37.23	.002
Management staff are generally not supportive of therapist-led initiatives	9.7	19.4	70.9	10.0	26.7	63.3	29.75	.555
Other personal attributes:								
I would be willing to advocate for the use of structured upper limb exercise manuals in my current work setting	93.5	6.5	0.0	80.0	20.0	0.0	34.92	.059

^a GRASP = Graded Repetitive Arm Supplementary Program.
^b Boldfaced P values represent significant differences.

not used or had not heard of GRASP felt they could not fully answer all of the questions, having not seen the content of the manuals, and this finding may explain the relatively high neutral response for those questions specifically relating to outcomes of using the manuals.

This study sought to make use of a novel opportunity to explore the opinions of therapists toward the implementation of a stroke rehabilitation intervention that has rapidly translated from research into clinical practice. The intervention was found to be most often discovered through word of mouth, which implies that more active methods of advertising and communicating new interventions are needed. It is certainly clear that some therapists and organizations are better positioned to implement new research evidence due to a culture of continuous improvement; therefore, the readiness of individual settings to implement change needs to be considered. The pitfalls of implementing an intervention too quickly, without robust evidence, also need to be guarded against. Overall, it appears that the relative advantage of an intervention is a key determining factor as to whether it will be implemented. However, it also could be argued that this is, in fact, the “perceived relative advantage” of the intervention by those who will ultimately be responsible for its implementation. This study has provided a valuable insight into the implementation of GRASP in practice in the United Kingdom, which occurred without a formal knowledge translation intervention. There is now a need for further research, underpinned by implementation theory, to identify whether the process of translating this effective evidence-based intervention into clinical practice could be enhanced.

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This study was approved by the University of Central Lancashire Research Ethics Committee.

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The work presented here is the first phase of a 3-year National Institute for Health Research (United Kingdom)–funded project that aims to develop a feasible structured upper limb exercise program in UK stroke rehabilitation units. The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the National Health Service or the National Institute for Health Research.

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Appendix.

Survey Questionnaire (Sections I and III)

Section I: Demographics

1. What is the job title for your current position?

- Physical therapist
 - Occupational therapist
 - Other (please specify)
-

2. Which band describes your current job position?

- Band 5
 - Band 6
 - Band 7
 - Band 8a
 - Band 8b
 - Other (please specify)
-

3. In which geographical location do you work?

4. How would you describe your current work setting?

- Acute care
 - Rehabilitation
 - Community (primarily outpatients)
 - Community (primarily domiciliary)
 - Other (please specify)
-

(Continued)

Appendix.

Continued

5. In what year did you qualify?

6. Do you work with people with stroke in your current job?

Yes

No

7. For approximately how many years have you been working with people with stroke?

0-2 years

3-10 years

>10 years

Section III: GRASP

The following questions relate to the Graded Repetitive Arm Supplementary Program (GRASP). GRASP is a set of manuals developed in Canada by Professor Janice Eng and Dr Jocelyn Harris. These manuals contain images and instructions and are used to deliver structured upper limb exercises to people following stroke.

1. Which statement best describes your experiences with GRASP?

I have never heard of GRASP

I have read about GRASP but never used it

I have spoken to colleagues about GRASP but never used it

I have tried using GRASP in practice on occasion

I regularly use GRASP in practice

Other (please specify)

2. Where did you encounter the GRASP manuals?

At a talk in the United Kingdom by Professor Janice Eng

Through my own research

Through informal discussions with colleagues

At a department in-service

Not applicable

Other (please specify)

(Continued)

Appendix.

Continued

3. Please identify to which extent you agree or disagree with the following statements:

A manual with graded progressions of structured upper limb exercise:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Would be beneficial for a therapist treating people with stroke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would not be applicable to a large proportion of stroke cases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would be unsafe to use with a stroke population	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would be too time-consuming to implement in practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would not be suitable in my work setting due to a lack of available equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would have positive outcomes for people with stroke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would undermine the role of the therapist in treating people with stroke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would be easily incorporated into current practice at my work setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Would involve too much printing and administration to be used in my work setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Please identify to which extent you agree or disagree with the following statements:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The use of upper limb task-specific exercises for people after stroke is well-supported by the evidence base	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be confident in my ability to use manuals to deliver structured upper limb exercise to people after stroke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would require further training to use manuals to deliver structured upper limb exercise to people after stroke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a culture of continuous quality improvement within my current work setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Management staff are generally not supportive of therapist-led initiatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be willing to advocate for the use of structured upper limb exercise manuals in my current work setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>