Interventions used by Allied Health Professionals in Sexual Rehabilitation After Stroke: a Systematic Review

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Abstract

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Background: Although sexuality can be affected post-stroke, few individuals receive sexual rehabilitation because of clinicians' lack of knowledge regarding evidence-based interventions.

Objective: To document and describe the best available evidence supporting interventions that target post-stroke rehabilitation of sexuality.

Methods: This systematic review searched the databases Medline, Embase, Psycinfo, CINAHL, Web of science, PEDRO and OTSeeker up to May 29, 2020. Inclusion criteria were: published studies with a sample composed of ≥ 50% stroke clients and describing an intervention that could be applied by an allied health professional. Data was extracted according to the PRISMA guidelines by two independent reviewers. Interventions were described according to the Template for intervention description and replication checklist.

Results: Among the 2446 articles reviewed, 8 met the inclusion criteria. Two randomized controlled trials (RCT) and one non-RCT showed improvement in sexual functioning and satisfaction following a 30-45-minute structured rehabilitation program. Two other RCT showed significant improvement in sexual functioning with physical therapy oriented towards 1) structured physical and verbal sexual counselling and 2) pelvic floor muscle training. Three studies showed that interdisciplinary sexual rehabilitation improved satisfaction and sexual functioning; implementation of an interview script for clinicians improved the proportion of clients who addressed sexuality from 0 to 80% in 10 months; and two-day couple retreats improved perceived intimacy between couples.

Conclusions: This review highlights promising interventions that could orient future research and improve the access to sexual rehabilitation services for post-stroke, with structured sexual rehabilitation and pelvic floor muscle training being the most strongly supported.

Keywords

Sexuality, stroke, rehabilitation, clinicians, intervention

Main text

Word count: 3 283

Introduction

Sexuality is an integral part of people's existence and is related to quality of life [1,2]. According to the World Health Organization, sexuality is defined as "a central aspect of being human throughout life that encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction. Sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviours, practices, roles and relationships" [3].Stroke affects sexuality in more than 50% of individuals [4] and can lead to many sexual difficulties, such as erectile dysfunction, loss of vaginal lubrication or a decrease in desire [5]. Of the approximately 10 300 000 persons around the world who survive a stroke each year [6], more than five million may present sexual difficulties. Few will have the opportunity to address them during their rehabilitation [7] even though this is likely to be among their priorities [8]. Addressing sexuality is also part of best practices guidelines in stroke rehabilitation in several countries, including Canada [9], Australia [10] and the United States [11]. Therefore, an important gap can be observed between clients' needs and actual clinical practices in stroke rehabilitation.

Many factors influence clinicians' position on discussing sexuality with clients in their practice, including concern about their own knowledge and skills regarding related interventions, lack of written information (e.g. leaflets, posters) and the absence of specific policies or guidelines on the subject [12]. Considering these factors, it can be hypothesized that clinicians are unaware of existing evidence-based interventions that could be used with stroke clients.

Two reviews on the topic of evidence-based intervention in sexual rehabilitation after a stroke have been published recently. A literature review conducted by Grenier-Genest and collaborators [5] on the subject of stroke and sexual functioning, with the secondary objective of reviewing intervention methods, showed that very few studies have been conducted on sexual rehabilitation interventions. However, the review was limited to a single bibliographic database (i.e. Pubmed). A Cochrane review published in 2020 on interventions for sexual dysfunction following stroke was conducted by Stratton and collaborators [13]. After an extensive search in 18 bibliographic databases, only three papers met their inclusion criteria, notably to be controlled clinical trials. The review may have neglected relevant intervention studies in an earlier stage of development, considering that this is an emerging research topic. Furthermore, since one of the three studies included focused on a pharmalogical intervention, there is clearly a lack of knowledge available to inform the practice of allied health professionals such as occupational therapists, physical therapists, nurses or speech-language pathologists.

The aim of this study was to document and describe the best available evidence supporting interventions that target post-stroke rehabilitation of sexuality.

Materials and methods

This study was conducted using the Preferred reporting items for systematic review and meta-analysis (PRISMA) protocols, as described by Moher and collaborators [14]. The research team consisted of four occupational therapists, an American Library Association accredited librarian specialized in rehabilitation and a master's student in occupational therapy.

Eligibility criteria

In order to be included in the present review, a study needed to report intervention

outcomes regarding sexuality after stroke. The study could use qualitative, quantitative or mixed methods, and participant selection criteria needed to include having experienced a stroke. At least half of the total sample needed to be stroke survivors, although it could include participants with various other conditions if the study met our other criteria. Studies addressing only medical or pharmacological interventions were excluded, as this review focused on sexual rehabilitation interventions offered by allied health professionals. However, methods used by physicians or other medical specialists that had the potential to be used by rehabilitation clinicians (e.g. educational or exercise sessions) were included. Regarding intervention outcomes, only those related to sexuality (e.g. function, satisfaction, behaviors, services) were addressed. Only papers written in English or French were considered.

Search strategy

The search strategy was developed collaboratively with the support of the second author who is a accredited librarian. A combination of keywords and descriptors were searched in MEDLINE, Embase, PsycINFO and CINAHL. Additional manual searches were conducted in Web of Science, PEDro and OTseeker. The articles were also retrieved using references lists and manual searches in relevant journals. The search strategy was customized for each database and included two key concepts: stroke and sexuality. A typical search strategy for one database (i.e. Medline) is showed in Appendix 1.

Data collection process

A literature search was conducted in each database from its inception up to May 29, 2020. For data extraction, all references from the initial search were first exported to EndNote X8 software. After duplicates were removed, the first and second authors carried out a blinded selection, based on the inclusion and exclusion criteria. This process involved an initial screening of the title and abstract of each article. Most disagreements between reviewers were

resolved by one consensus-based discussion, in some cases followed by consultation with the last author who acted as a third reviewer. To standardize the process after the initial search, the two reviewers analyzed the titles and abstracts from the database CINAHL and compared their results. Once their respective perceptions of the data had been shared and standardized, the two reviewers analyzed the remaining data. A second screening of complete article content was then conducted by the first and last authors. Figure 1 depicts the PRISMA flow chart of this systematic review. Data from the selected articles was then extracted by the first author.

Risk of bias in individual studies

Risk of bias and quality of the intervention studies was assessed using the *Oxford Centre for Evidence-Based Medicine* (OCEBM) levels of evidence (see Table 1). The OCEBM levels of evidence range from one to five, and the closer to one, the stronger the conclusions that can be drawn based on the study findings. The intervention methods were described using the Template for Intervention Description and Replication (TIDieR) checklist [15] in Table 2.

Synthesis of results

Intervention methods and their outcomes were categorized according to the *Evidence-Based Classification of Occupational Therapy Interventions* [16]. When extracting study and intervention characteristics, the first author associated each method to the eight types of interventions described by McColl and Law [16] targeting either the person (training, education, skill development), the occupation (task adaptation, occupational development) or the environment (environmental modification, support provision, and support enhancement). For each intervention method included in the review, the categories of intervention and the

specific types are presented in Table 1 in order of importance, the first being the most contributing to the intervention.

Results

Study selection

A total of 2 446 articles remained after duplicates were removed from the initial database search and manual searches (see Figure 1). After irrelevant articles were excluded, eight matched the inclusion criteria. Description and results of each of the studies, including description of the participants, are presented in Table 1, and details about each intervention are presented in Table 2.

(Insert Figure 1 approximately here)

Risk of bias within studies

Among the intervention studies, four were randomized controlled trials [17-20]. The others were: a non-randomized controlled trial [21], a cohort study [22], a case study [23] and a prospective study [24]. The level of evidence of these studies varied and is reported in Table 1.

(Insert Table 1 approximately here)

Synthesis of results

Among the intervention studies, four presented the impact of a structured sexual rehabilitation program [18-21], one a case of interdisciplinary sexual rehabilitation [23], one the implementation of a systematic sexuality-related discussion [24] and two the impact of a specific intervention, i.e. pelvic floor muscle training [17] and a retreat for couples in which one is aphasic [22].

Two randomized controlled trials (RCT) [18,19] and one non-randomized controlled trial [21] assessed the effect of a sexual rehabilitation program consisting of one 30-45 minute session with a clinician offering sexual counselling and education targeting a stroke clientele. The program followed the sexological intervention model PLISSIT [25], which stands for Permission, Limited Information, Specific Suggestions, Intensive Treatment and offers

guidelines to clinicians in addressing sexuality in their practice . Sample sizes varied between studies from very small (n=4/group) to moderate (n=38/group). The sexual rehabilitation program was compared to offering written documentation regarding sexuality after a stroke [18,19] or no intervention in Song and collaborators' [21] study. The two RCT led to improved sexual function between baseline and six weeks post-intervention as measured by the Change in Sexual Function Questionnaire (CSFQ-14) [26] but no between-group difference was found (Ng: $p = 0.758$; Sansom: $p = 0.255$). A significant difference between experimental and control participants was observed in the study by Song and collaborators [21] for sexual satisfaction ($p = 0.02$), frequency of sexual activity ($p < 0.001$) and frequency of sexual intercourse ($p = 0.001$) one month after the intervention.

In the randomized controlled trial by Vajrala and collaborators [20], a physical therapist provided skill development (e.g. transfer and bed mobility) and physical training contextualized to sexuality combined with verbal counselling based on the PLISSIT model [25] to 20 stroke clients in inpatient rehabilitation for one hour per day over a two-week period. Compared to the 20 control participants who received the usual rehabilitation services, sexual functioning improved significantly ($t = 8.9$, $p < 0.05$) in the experimental group six months after the intervention.

The twelve-week program of pelvic floor muscle training (PFMT) for men conducted by Tibaek and collaborators [17] combined weekly group sessions and daily individual exercise. This program led to a statistically significant improvement ($p = 0.04$) in erectile function for the 16 men in the experimental group, from a median score of 18/25 [5-24] to 20/25 [5-25], both of which can be qualified as "mild erectile dysfunction" according to the International Index of Erectile Function – 5 [27].

Thomas [23] described the case of a woman who underwent interdisciplinary sexual rehabilitation in an outpatient setting. While the article focused on describing the occupational

therapy intervention, as well as the contribution of physical therapy, speech therapy, psychology and medicine, the results showed that the woman attained all her occupational therapy objectives related to sexuality and intimacy and that her score improved on the Canadian Occupational Performance Measure [28] (pre: 4/20; post: 11/20; 175% improvement) and the Quality of Sexual Function Scale [29] (pre: 96/160; post: 61/160; 36% change).

The study by Guo and collaborators [24] was carried out in collaboration with occupational therapists and speech language therapists in a rehabilitation hospital. The systematic use of a standardized script for interviews and a teaching session on sexuality led to an important improvement in the proportion of clients who had the opportunity to address sexuality issues (i.e. from 0 to 80% in ten months).

In the cohort study by Stead and White [22], 11 couples, each with one aphasic person, completed a survey after attending a weekend retreat aimed at promoting each couple's recovery and reconnection. Qualitative results of this study showed that participants felt supported, and left feeling rested and more connected to their partner.

(Insert Table 2 approximately here)

Additional analysis

Among the eight intervention methods included in the review, six mainly targeted the person, one the occupation and one the environment (see Table 1). Interventions were multimodal for six studies [18-23], one was only oriented towards the person [17] and one only towards the environment [24]. Education was the type of intervention most importantly present in five of the eight intervention methods, with training, support enhancement and skill development each predominating in only one study. The intervention described by Thomas [23] was the only one that addressed the person, the occupation and the environment, and covered six different modes of intervention.

Discussion

The aim of this study was to document and describe the best available evidence supporting interventions that target post-stroke rehabilitation of sexuality that can be offered by an allied health professional. A total of eight intervention studies relevant for allied health professional practice met the criteria for inclusion in this review. Most interventions (n= 6/8) were mainly focused on the person. Structured sexual rehabilitation programs [18-21] based on the PLISSIT model [25] and pelvic floor muscle training [17] were the most supported by evidence and are actually the most promising interventions for use by allied health professionals. Such programs were not typically meant to be administered by a single profession, with certain administrators being physicians or nurses [18,19,21]. Two other studies highlighted the contribution of physical therapists to sexual rehabilitation, not only in regard to pelvic floor muscle training [17] but also for training clients in specific physical abilities required for sexual activities (e.g. bed mobility, positioning) and sexual counseling [20]. However, the outcome of pelvic floor muscle training among women who have sustained a stroke is unclear, as the only relevant study [30] was specifically oriented towards men. These five studies also show the impact of providing appropriate informative documentation on clients' sexual functioning. In fact, in two of these studies [18,19], the control group received the same written documentation as the experimental group, but without participating in the sexual rehabilitation program. The fact that both groups showed improvement regarding sexuality, and that no significant between-group difference was found, supports the relevance of providing written documentation to the stroke clientele. This would also meet clients' preferences, as Stein and collaborators' [8] cross-sectional study showed that among the 38 participants who sustained a stroke, informative printed material was the most (33.3%) and second-most (37.5%) preferred method of receiving information about sexuality. The last study describing an intervention oriented towards the person presented couples retreats [22], which could be promising

psychosocial interventions for persons who have sustained a stroke, and their partners, once they reintegrate the community, in the chronic phase of stroke. Therefore, even though the evidence supporting these interventions is limited, interdisciplinary sexual rehabilitation, physical rehabilitation focusing on sexuality and couples' retreats appear to lead to meaningful results for the stroke clientele's sexuality. They are promising methods that would require further investigation of their impact and that could eventually be more widely implemented in stroke rehabilitation.

Although of a lower level of evidence [31], the two other studies included in this review can inform future research and implementation of better practices in clinical settings. In fact, Guo and collaborators' [24] study was the only one oriented exclusively towards the environment, and showed that a collaborative approach between research and clinical settings such as action-research have a high potential to lead to concrete changes in the provision of services related to sexuality. These methods could be relevant for the future implementation of the higher-level interventions described earlier, especially the structured sexual rehabilitation programs. Thomas' [23] study was the most multimodal intervention and the only one mainly focused on occupation, although the person and the environment were given some consideration. This focus on activities is very likely related to the fact that the article primarily described occupational therapy interventions, whose contribution to sexual rehabilitation has been presented elsewhere [32]. In her case study, Thomas [23] highlighted the privileged position of occupational therapists for properly addressing sexuality. This also concurs with the choice of rehabilitation clinicians in Guo and collaborators' [24] study, in which occupational therapists were asked to initiate a conversation about sexuality with each client. Interdisciplinary sexual rehabilitation tailored to the specific needs of the client, with the occupational therapist as case manager, showed great potential to lead to significant

improvements for the clientele in Thomas' [23] case study, and supports the assumption that sexual rehabilitation after an acquired brain injury should be interdisciplinary [33].

When combining the results of each of the studies presented here, interventions should be tailored to the stage of sexual rehabilitation. In acute care, written documentation should be prioritized, as clients can be overwhelmed in the days and weeks immediately following a stroke [34]. Documentation such as informative pamphlets should also be offered in the rehabilitation setting [8]. Inpatient rehabilitation could offer a structured program, during the week preceding discharge, a one-time session 30-45 minutes individual consultation based on the PLISSIT model [18,19,21,25]. Outpatient rehabilitation could also offer structured sexual rehabilitation programs, combined with more diversified interdisciplinary support [23], including pelvic floor muscle training [17] and skill development and sexual counseling [20] for clients to achieve the sexual activities they wish to engage in. For community care, one-time interventions such as an annual retreat could promote couples' well-being and foster intimacy between them. However, sexual rehabilitation interventions after a stroke should not only be focused on persons in a relationship but also on the individuals and their personal objectives regarding sexuality.

Strengths and Limitations

Among the strengths of this systematic review is the fact that it was conducted following the PRISMA guidelines [14]. Moreover, the research team included an ALA accredited librarian who was involved in the entire process and ensured the development of an extensive search strategy. Finally, blinded data collection , as well as data extraction according to the OCEBM [31] and the TIDIeR [15], attest to the quality of data reported and its usefulness for clinical and research purposes.

This review also has certain limitations. The potential bias in each of the studies analyzed affects the quality of this review. By including level 4 studies such as a case study,

this review risks a certain bias, as the cost of conducting an exhaustive literature review that included a wide range of research designs.

In conclusion, this systematic review presented evidence-supported interventions, and their outcomes, that target rehabilitation of sexuality after a stroke. It highlighted approaches that could be applied and implemented immediately by allied health professionals in their practice with a stroke clientele. It also showed that most research conducted until now has been oriented towards interventions that target the person post-stroke, but that multimodal interventions and approaches focusing on the environment could also yield meaningful results. This review confirms the importance of conducting further research in the field of sexual rehabilitation following a stroke with a focus not only on the person as they regain skills, but also on their environments (e.g. caregivers), thereby including relatives and healthcare settings, and involving workers in the full range of allied health professions.

Declaration of interest statement

The authors report no conflict of interest.

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Appendix 1 – Search strategy in Medline

1. exp Stroke/ or exp Stroke Rehabilitation/
2. (stroke* or cerebrovascular accident* or cerebr* vascular accident* or poststroke).ab,kf,kw,ti.
3. 1 or 2
4. exp Sexual Behavior/
5. exp Sexual Dysfunctions, Psychological/ or exp Sexual Dysfunction, Physiological/
6. exp Sexuality/
7. exp Orgasm/
8. exp Sex Counseling/
9. (sexual* or sexolog* or psychosex* or intimac* or intimate*).ab,kf,kw,ti.
10. (sex adj1 (satisfaction or therap* or dysfunction* or counsel* or activit* or behavio* or rehabilitation or life or health)).ab,kf,kw,ti.
11. 4 or 5 or 6 or 7 or 8 or 9 or 10
12. 3 and 11

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRIMA) flow chart of articles selection process

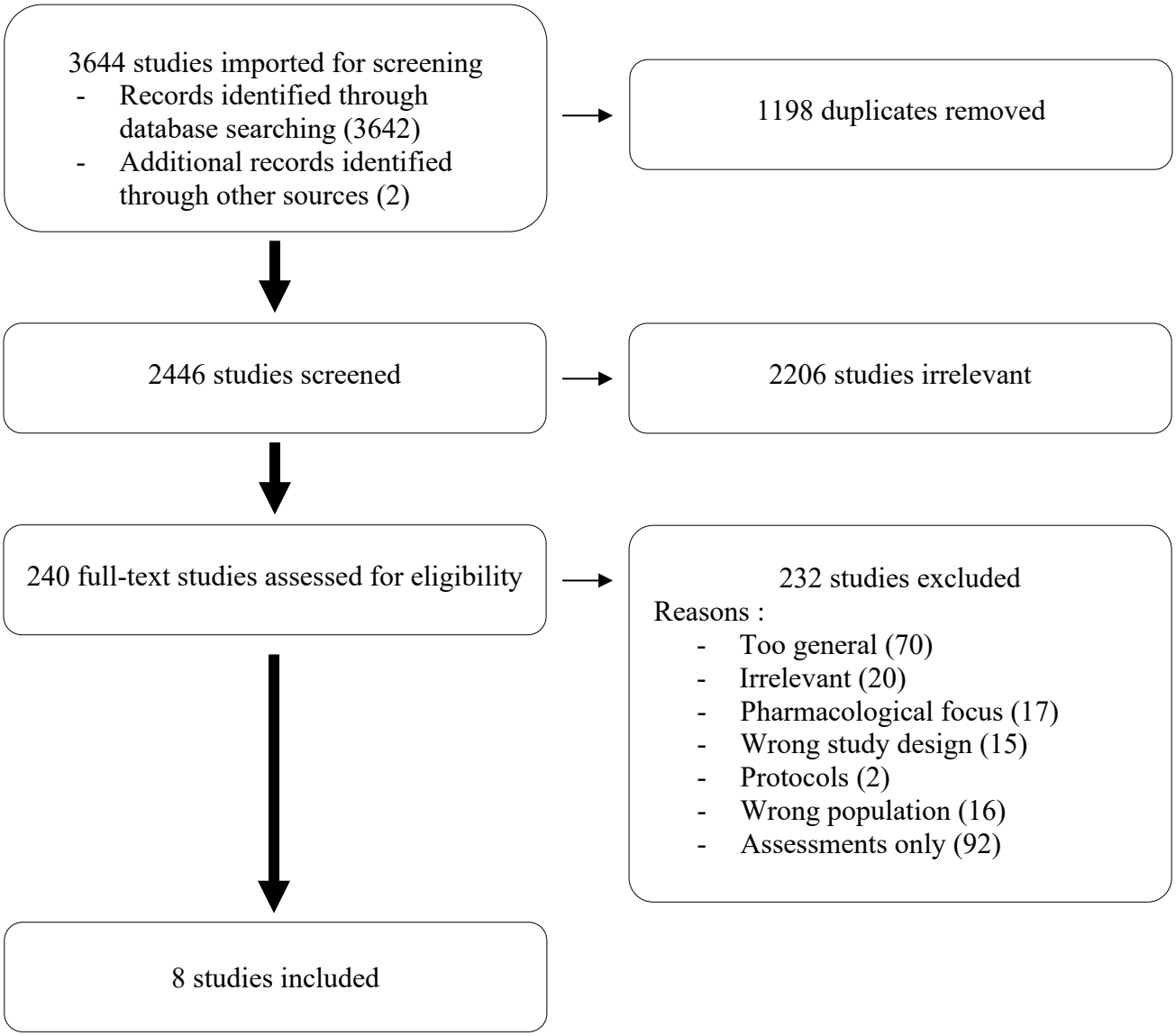

Table 1: Characteristics and results of studies that addressed sexual rehabilitation (intervention) after a stroke (n=8) presented in order of the Results section

Author, year	Country	Design	Level of evidence[A]	Population	Intervention	Type of intervention*	Study objectives	Main results
[21]	South Korea	Non-randomized controlled trial	2b	23 stroke clients (19 males and 4 females) and their partners. EXP group: 12 couples, CTRL group: 11 couples. Mean subjects' age: 57.89 ± 6.59 years. Number of days post-stroke was not provided but clients were recruited during inpatient rehabilitation.	Sexual rehabilitation intervention program	PERSON and OCCUPATION Education, task adaptation	Examine whether a sexual rehabilitation intervention program was effective in terms of sexual knowledge and satisfaction and frequency of sexual activity at 1 month after intervention.	Sexual satisfaction score in the EXP group was significantly higher than that in the CTRL group (23.63 ± 8.20 versus 16.23 ± 11.82, Z = −2.29, p = 0.02); Frequency of sexual activity (e.g. masturbation, oral sex, sexual intercourse) in the EXP group was significantly higher than that in the CTRL group (4.29 ± 2.53/month versus 1.86± 1.61/month, F = 14.77, p < 0.001); Frequency of sexual intercourse in the EXP group was significantly higher than that in the CTRL group (3.31 ± 2.70/month versus 1.18 ± 1.22/month, F = 11.51, p = 0.001); Sexual knowledge was higher in the EXP group but not significantly different from the CTRL group (10.46 ± 2.77 versus 9.32 ± 3.73; Z = −1.19, p = 0.24).
[19]	Australia	Randomized controlled trial	2b	12 participants (10 clients and 2 partners) were randomly assigned to an EXP (n=4 clients) or CTRL (n=6 clients) group. The mean age of participants was 66.3 years (range: 34–88 years), with an equal number of males and females. Most (67%) of the participants were married or had a partner. Number of days post-stroke was not provided but clients were recruited during inpatient rehabilitation.	Structured sexual rehabilitation program	PERSON and OCCUPATION Education, task adaptation	Assess the effectiveness of a structured sexual rehabilitation program combined with the use of written material compared to the use of written material only, and to evaluate the impact of both interventions on sexual and psychological function in an Australian stroke cohort.	There was no significant difference between the EXP and CTRL groups (p = 0.255) in terms of sexual functioning according to the Change in Sexual Functioning Questionnaire (CSFQ-14) [26] six weeks after the intervention. There was a trend toward improvement in both groups in sexual functioning.

EXP: Experimental; CTRL: Control; A: According to the Oxford Centre for Evidence-based Medicine – Levels of Evidence (OCEBM; [31]); *According to the eight types of intervention in occupational therapy [16]: training, education, skill development, task adaptation, occupational development, environmental modification, support provision, and support enhancement; The underlined mode of intervention is considered the major intervention and the other modes are minor

Table 1 (continued)

Reference	Country	Design	Level of evidence[A]	Population	Intervention	Type of intervention*	Study objectives	Main results
[18]	Australia	Randomized controlled trial	1b	68 stroke survivors were included at baseline: 35 in the EXP group – mean age 62.0 ± 17.3) and 33 in the CTRL group – mean age 66.8 ± 16.7). Number of days post-stroke was not provided but clients were recruited during inpatient rehabilitation.	Individualized sexual rehabilitation program	PERSON and OCCUPATION Education, task adaptation	To assess the effectiveness of a comprehensive structured sexual rehabilitation program compared with written information alone, on sexual and psychological function, and on functional independence and quality of life in a stroke cohort	6 weeks after the intervention, both groups improved sexual functioning and no difference (p = 0.758) was found between the EXP and CTRL groups with the Change in Sexual Function Questionnaire (CSFQ-14) [26]. At 6 months, the only difference in the sexuality assessment was that CTRL participants had higher scores in the arousal items (p = 0.027).
[20]	India	Single - blinded randomized controlled trial	1b	EXP group/ CTRL group. Age (years)* 40.2 / 42.1; Gender (male/female) EXP : 10/10, CTRL : 12/8; Time post stroke before recruitment* (in Months) 5.85 / 4.5	structured physiotherapy and verbal communication	PERSON and OCCUPATION skill development, Education, training, task adaptation	To investigate the role of structured physiotherapy and verbal communication in improving Physical dimensions and on the Psychological dimensions of sexual health after a stroke	The mean of differences between pre-test and post-test CSFQ-14 in EXP group is 22.7 SD +/-9.65 and that of CTRL group is 3.5 SD +/- 5.37 (t = 8.9, p < 0.05)
[17]	Denmark	Randomized controlled trial	1b	30 males with lower urinary tract symptoms after stroke. EXP group: 16 male – 68 years-old [57–73]. CTRL group : 15 male - 70 years-old [64–75]. All participants: median age: 68 years; interquartile range: 60–74 years. Time since last stroke: EXP group: 55 days (50-	Pelvic floor muscle training	PERSON Training, education	evaluate the effect of pelvic floor muscle training (PFMT) on measured erectile function as an indicator of sexuality in men with LUTS after stroke.	The results showed a significant improvement in the EXP group from pre-test to post-test (p = 0.04), but not in the CTRL group (p = 0.32) according to the International Index for Erectile Function (IIEF-5) [27]. There were no significant differences between EXP group and CTRL group either at pre-test (p = 0.97) or at post-test (p = 0.84). At 6-month follow-up, the results showed no significant difference between groups (p = 0.08) or within groups (pre-test versus follow-up; EXP: p = 0.8, CTRL: p = 0.18). However, IIEF-5 sum scores within pre-test and follow-up were lower in the CTRL group (EXP: 15/25; CTRL: 11/25).

				63); CTRL group: 65 days (50-87)				

EXP: Experimental; CTRL: Control; A: According to the Oxford Centre for Evidence-based Medicine – Levels of Evidence (OCEBM; [31]); *According to the eight types of intervention in occupational therapy [16]: training, education, skill development, task adaptation, occupational development, environmental modification, support provision, and support enhancement; The underlined mode of intervention is considered the major intervention and the other modes are minor

Table 1 (continued)

Reference	Country	Design	Level of evidence[A]	Population	Intervention	Type of intervention*	Study objectives	Main results
[23]	United States	Case study	4	a 69-year-old, married, Hispanic heterosexual woman who suffered a right stroke. Outpatient rehabilitation began around 24 days post-stroke.	Interdisciplinary sexual rehabilitation	OCCUPATION, ENVIRONMENT and PERSON Education, skill development, task adaptation, training, environmental modification, support enhancement	Describe the process and outcomes of the client's rehabilitation	After 5 weeks of therapy, the participant met all her objectives. The couple's Canadian Occupational Performance Measure [28] (performance and satisfaction) went from 4/20 to 11/20, showing a 175% improvement in the total score for intimate activities. Significant changes were also seen on the Quality of Sexual Function Scale [29]. The couple's overall score was initially 96/160 and 61/160 at follow-up, demonstrating a 36% change. There were no significant changes in the client's scores on the Stroke Impact Scale [36].
[24]	Canada	Action research using a Plan-Do-Study-Act methodology	4	Stroke rehabilitation clients and healthcare professionals from an inpatient rehabilitation facility. Age: Not specified	Implementation of procedures for provision of sexuality services.	ENVIRONMENT Support enhancement, environmental modification	To provide all stroke clients in inpatient rehabilitation with the opportunity to discuss sexual health concerns with healthcare providers	At baseline (1-3 months), 0% of clients addressed sexuality. At the end of the implementation period (10 month), the monthly proportion of stroke clients who had addressed sexuality during their rehabilitation was 80%. 100% was attained at 9 months.
[22]	United States	Cohort study	4	Couples with one partner who has aphasia. Sample included people who were between 5 months to 19 years post-stroke	the Aphasia Couples Retreat	PERSON and ENVIRONMENT Education, skill development, support provision, support enhancement	Describe the intervention and report preliminary outcomes (not clearly stated in the article)	Post-retreat surveys indicated that, overall, participants reported feeling refreshed and with a better connection to their partners.

EXP: Experimental; CTRL: Control; A: According to the Oxford Centre for Evidence-based Medicine – Levels of Evidence (OCEBM; [31]); *According to the eight types of intervention in occupational therapy [16]: training, education, skill development, task adaptation, occupational development, environmental modification, support provision, and support enhancement; The underlined mode of intervention is considered the major intervention and the other modes are minor.

Table 2: Description of the sexual rehabilitation interventions using the Template for Intervention Description and Replication (TIDIeR) checklist [15]

[21] - Sexual rehabilitation intervention program				
Why	**What – material**	**What - procedure**	**Who provided**	**How**
Sexual rehabilitation after stroke	A 35-page booklet was also distributed to participants. Produced by the research team, contact info: wschang@inha.ac.kr.	Topics addressed with participants were divided in 5 subjects: 1) information on common sexual problems and major causes of changes in sexual life after stroke, 2) general information regarding a healthy sexual life, 3) counseling on fears regarding post-stroke sexual life, 4) tips and specific strategies to minimize post-stroke sexual dysfunction, and 5) frequently asked questions and answers regarding post-stroke sexuality.	The first author of the study (HoSook Song) offered the program. The context suggests that he has a nursing background.	The program was offered to the stroke client and the partner the day before discharge.
Where	**When and how much**	**Tailoring**	**Modifications**	**How well: actual**
Counseling in a small conference room. The article suggests that it was only presented to one couple at a time.	The day before discharge from inpatient rehabilitation. One session of 40-50 minutes.	Not specified	Development followed programs for spinal cord injury, lumbar disc and stroke. Beta version of the program was revised by nursing experts and was further modified after feedback from two clients.	A total of 46 subjects (12 couples in the EXP group and 11 couples in the CTRL group) were included and completed the program. 7 couples dropped out for no specified reason.
[19] – Structured sexual rehabilitation program				
Why	**What – material**	**What - procedure**	**Who provided**	**How**
Sexual rehabilitation in order to have an impact on sexual and psychological function.	A fact sheet by the Australian Stroke Foundation [37] to both EXP and CTRL groups.	EXP group: A one-session sexual rehabilitation intervention, inpatient or outpatient. Partners could be involved. The program included: information regarding common changes in sexuality post-stroke; counselling on fears regarding post-stroke sexuality; challenging stereotypical views on sexuality and satisfaction; tips and strategies to minimize post-stroke sexual dysfunction; reviewing medication that may affect sexuality; managing urinary incontinence.	The intervention was conducted by a rehabilitation physician, with additional input from occupational therapists, physiotherapists and/or psychologists as required.	Provided in a single private session.
Where	**When and how much**	**Tailoring**	**Modifications**	**How well: actual**
Inpatient or outpatient in an Australian hospital	The intervention consisted of one session of 30 minutes. All participants but one in the EXP group received the intervention toward the end of their inpatient stay; one participant chose to receive intervention as an outpatient. For CTRL group, it was not clarified when the material was provided.	Programs were tailored to each individual's needs and were based on the PLISSIT model (Annon, 1976). Content was similar to the sexual rehabilitation program by Song et al. [21]	Not specified	All clients in the intervention group received counselling from the rehabilitation physician only, with no further allied health input.

EXP: Experimental; CTRL: Control.

Table 2 (continued)

[18] – Structured sexual rehabilitation program				
Why	**What – material**	**What - procedure**	**Who provided**	**How**
Sexual rehabilitation after stroke	Written educational material produced by the Australian Stroke Foundation [37].	The program consisted of a single 30-min individualized session with the offer of additional input from professionals in occupational therapy, physiotherapy and or psychology as required. Sexual partners of participants were invited to participate in the sessions with the consent of the participant where possible/available. Content of the program followed another study [19].	The intervention was provided by one of the two physicians of the clinical setting (7 years of experience in delivering sexual rehabilitation)	Individual therapy session.
Where	**When and how much**	**Tailoring**	**Modifications**	**How well: actual**
In inpatient setting	The educational material was provided at the time of recruitment. A meeting was then set with the EXP participants for a single 30-minute individual session with the physician, early enough during rehabilitation to enable consultation with other professionals prior to discharge if needed.	Programs were individually tailored and based on the PLISSIT model [25].	Not specified	Of the 68 participants at baseline, five in the EXP group and three in the CTRL group dropped out at the 6-week follow-up and a further five participants in the EXP group and four in the CTRL group dropped out at 6 months, leaving 51 in total (25 in the EXP group, 26 in the CTRL group). Participants in the EXP group tended to largely listen and/or read the written information provided at the time of recruitment and asked no questions during the 30-min individual session they received. Participants in the CTRL group only read the information provided and none requested any additional information.
[20] – Structured sexual rehabilitation program				
Why	**What – material**	**What - procedure**	**Who provided**	**How**
Improving physical dimensions of sexual health and verbal communication among stroke survivors	Therapeutic bed, bolsters.	The EXP group followed an individualized sexual rehabilitation program daily, which included counselling in the form of verbal communication, training bed mobility, active and passive movement physiotherapy, sexual positioning and transferring activities in and out of bed. The physiotherapist used pictorial illustrations to demonstrate various alternative sexual positions to enable adaptation to the motor skills of the patient. Patients were given Verbal counseling on Sexual Health After discharge, were provided with pictorial and written instructions about sexual positioning, oral sex, and various exercises, and was advised to continue at home. The control group was given conventional physical therapy rehabilitation.	Training was given under the direct supervision of a trained physiotherapist.	The individualized sexual rehabilitation program was given in person.
Where	**When and how much**	**Tailoring**	**Modifications**	**How well: actual**
Hospital setting	1-hour individualized sexual rehabilitation program daily; for a period of 2 weeks during the hospital stay.	Verbal counselling was tailored according to the PLISSIT model [25]	Not specified	Little information about attendance is included in the article, however the calculated effect size suggests that every participant completed the study.

EXP: Experimental; CTRL: Control.

Table 2 (continued)

[17] – Pelvic floor muscle training

Why	What – material	What - procedure	Who provided	How
Rehabilitation of erectile dysfunction and lower urinary tract syndrome after stroke	Not specified	The program was composed of a theoretical introduction session, followed by pelvic floor muscle group treatments, combined with exercises at home.	A specialized physiotherapist in pelvic floor muscle therapy	Group sessions (animated by a physical therapist) and individual exercises at home.

Where	When and how much	Tailoring	Modifications	How well: actual
Not specified	One 60-min group session per week, with 3 to 6 participants. Exercises at home 1-2 times per day. 12-week program	The training program was a modified version of a standard program for group treatment of stress incontinence [30,38].	Not specified	The 30 participants, 15 in each group, with a median age of 68 (interquartile range 60–74), completed the study. At follow-up, one participant from the CG was lost for follow-up. Attendance in group -treatment sessions ≥ 8/12 sessions. No adverse events were reported.

[23] – Interdisciplinary sexual rehabilitation

Why	What – material	What - procedure	Who provided	How
For the couple to return to their roles as intimate partners	Not specified	The occupational therapist started the follow-up regarding sexuality – the client was provided with educational materials, teaching and reassurance regarding sexual activity post-stroke. After assessments, decisions were made with the patient to make referrals to speech therapy, physical therapy, psychology and the physician. The OT then established long and short term objectives with the patient and pursued the follow-up. Every professional worked in a multidisciplinary fashion and confidential information was only shared when needed.	Occupational therapist, physical therapist, speech-language therapist, psychologist, physician	Occupational therapy interventions were mostly done with the partner present and included: education (i.e. ways of expressing sexuality), bodily sensations mapping, homework assignments, spasticity management, positioning, transfer and bed mobility training, scheduling daily activities, including sexual activities and couple activities, respite/caregiving resources references for the partner, environmental adaptations and assistive devices (provision and education), education on energy conservation; The speech therapist focused on promoting the woman's communication of her wants and needs to her husband, using traditional and alternative methods; The physical therapist worked on pelvic floor strengthening to address the incontinency issues.; The psychologist addressed the role conflict issues in the couple and provided more in-depth sexual counseling.; The physician prescribed an antispasmodic medication to reduce spasticity and education on potential side effects.

Where	When and how much	Tailoring	Modifications	How well: actual
Outpatient stroke rehabilitation settings	Week 1: OT addresses sexuality; Weeks 3-4: discussion about sexuality with Mrs and husband; Weeks 5-9 (total of 5 weeks): sexual rehabilitation in OT and other disciplines. The participant had OT 1x/week	Using the PLISSIT model [25], the interventions followed participant preference	Not specified	After 5 weeks of therapy, the participant attained all her objectives. No mention of missed sessions in the article suggests good attendance.

EXP: Experimental; CTRL: Control.

Table 2 (continued)

[24] – Implementation of procedures for provision of sexuality services				
Why	**What – material**	**What - procedure**	**Who provided**	**How**
Giving stroke clients an opportunity to have a conversation about sexuality with a rehabilitation clinician	The clinicians used a checklist to keep track of issues that they address with clients during their rehabilitation stay. Sexuality was added to the checklist (reminder mechanism); a standardized script to address sexuality was followed.	Prior to the study, interviews were held with clinical team members and five discharged clients. Based on the barriers identified, standardization and reminders were selected as initial options for change concepts. The occupational therapists proposed that discussions about sexual health concerns could take place during their intake assessments. The occupational therapists used the checklist and the script in their practice. A visual conversation-support tool for sexual health that mirrored the standardized script was also created to facilitate the conversation with aphasic clients.	Occupational therapists in general and speech language therapists if clients had aphasia.	Clients were interviewed by clinicians in the rehabilitation facility. Collaboration process between investigators and stakeholders was not clarified, but the article suggests a mix of in-person meetings and remote follow-ups.
Where	**When and how much**	**Tailoring**	**Modifications**	**How well: actual**
In the rehabilitation hospital	The study gathered data for ten months, including the first three that formed the baseline. Therefore, the active implementation of the project lasted seven months.	The intervention was implemented in collaboration with stakeholders. The tailoring was proposed by OT and speech therapists during collaborative work with the investigators.	Not specified	Proportion of clients having discussed sexuality: Months 1-3 (baseline): 0%; 4th: 50%; 5th: 75%; 6th: 55%; 7th: 55%; 8th: 75%; 9th: 100%; 10th: 80%.
[22] – the Aphasia Couples Retreat				
Why	**What – material**	**What - procedure**	**Who provided**	**How**
Support couples with one partner who has aphasia in their recovery and reconnection	Documents and schedules were created by the research team	Aphasia Couples Retreat. Some of the topics explored included: Changing roles and the effect on the identity of individuals and the couple; How to revive former interests and find new activities to share together; How aphasia and related conditions affect intimacy and relationships.	An interdisciplinary team of occupational therapists, speech–language pathologists, neuropsychologists, nurses, and Aphasia Network staff. Each couple is paired with an interdisciplinary student team of one speech–language pathology and one occupational therapy graduate student to support them throughout the weekend in both communication and mobility needs.	The retreat has a maximum capacity of 15 couples, including 2 peer mentor couples. Approximately 40% (7 out of 18 hrs) of the weekend is spent in small or large group sessions addressing individualized issues related to marriage, aphasia, and adjustment. The other portions are spent engaging in group meals, social times, leisure activities, and rest.
Where	**When and how much**	**Tailoring**	**Modifications**	**How well: actual**
Retreat in the local community	Once a year, over a weekend, for a total amount of 18 hours.	The Aphasia Couples Retreat follows the Ex-PLISSIT model [39] during group and individual sessions. All activities during the weekend are adapted for aphasia (e.g. visual schedules and supports, individual assistive devices)	Not specified	Little information about attendance is included in the article. However, 11 couples completed the post-retreat questionnaire, indicating that at least that many couples attended the weekend.

EXP: Experimental; CTRL: Control.