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ERGONOMICS APPROACH TO ASSESS THE RISK ASSOCIATED WITH THE PERFORMANCE OF DOMESTIC TASKS–PART "A"

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ABSTRACT

Background: Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) are essential to live independently (Lawton & Brody, 1969). Slowing down a person's decline or utilising equipment to maintain independence is a growing area of research. Although, the way we carry out daily tasks within the home can accelerate this decline. Therefore, it is essential to consider and reduces the dependency issues within society, which enable individuals to live independently in their homes for as long as possible and to participate happily in their daily or social activities.

Methods: Initially a survey was used to gather different people's insights about the performance of ADL and IADL tasks. An observational study is also used to evaluate the postural load on selected IADL tasks. Finally, ergonomics approach was used to develop a Task Assessment Tool for Ease and Risk (TAER).

Result: TAER is developed to provide a self-assessment method of screening the domestic tasks for exposure of psychological and physical risk factors associated with the performance of daily tasks. TAER is helpful in the detection of early warnings for healthy individuals as well as for those undergoing rehabilitation, as it can easily identify the tasks that are hardest to perform. TAER consist of booklet and record sheets and based on three risk parameters.

Conclusion: TAER is simple to use and believed that it may play vital role in the development of comprehensive and proactive strategies for the detection of problems related to the home environment and manage them effectively before it can affect our quality of life.

Keywords: TAER (task assessment tool for ease and risk), IADL (instrumental activities of daily living), psychological perception of the task, postures adopted, manual handling.

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1.0 Introduction

Performing daily tasks and activities are not easy but performing daily tasks by individual is essentials to maintain the independent lifestyle. Our quality of domestic life based on effectively performing basic activities of daily living (ADLs) (MedicineNet.com; Nordenskiold, 1994; Wiener, Hanley, Clark, & Van Nostrand, 1990) and instrumental activities of daily living (IADLs) (Lawton & Brody, 1969; Rivlin, Wiener, Hanley, & Spence, 1998) tasks which increases the satisfaction in all aspects of life. Tasks and activities performed in home environment are much harder to perform when compared to an industrial environment. In industry, personnel perform a task over a period of time but in the home environment a person is doing many tasks simultaneously and no one is supervising him or her, so the person is performing these tasks as they like. Therefore, that person is exposed to psychological (anxiety, fatigue, perceived physical demand and perceived complexity) and physical (adopted postures and manual handling) risk factors.
According to Hedge et al., the risk of musculoskeletal disorders (MSDs) occurs both within and outside the work place (Hedge, Rudakewych, & Weitz, 2002). Therefore, it is probable that a person may aggravate their level of MSD risks by performing daily tasks or activities (non-occupational). To date, very little attention has been paid to the possible roles of non-occupational exposure within the home environment in the development of non-occupational MSD risks. Therefore, this piece of work was carry out in relation to such daily tasks and activities to quantify the risk level which might be helpful in order for people to maintain their independence and lifestyle, and to lead full, active and safe lives in their own homes. There are many current tools available within the ergonomics and occupational therapy contexts but they are not suitable for evaluating the risks in performing tasks in a home environment because domestic tasks are performed infrequently and last for short interval of time. Therefore, there was a need of designing a tool which should be able to assess the risk level associated with single task and also assessed general behaviour or domestic load over a period of time.

The tool should also be helpful in identifying those tasks which require more caution when being performed and which are responsible for a person's change in behaviour in later life. The prevention and controlling of the risk of injury, through knowledge in relation to activities of daily life is the key way for a person to improve their level of independence and an appropriately designed tool can help individuals to prioritize their tasks according to their ability to perform.

2.0 Methods

Figure 1 shows the overall development process of TAER. The initial development of TAER based on two phases: (1) first phase, development of TAER prototype, (2) second phase, evaluation of user trials based on (a) ease of use of TAER record sheet and (b) validity study. The second phase aimed to evaluate the ease of use of TAER recording sheet, while validity study aimed to determine the authenticity of TAER outcomes by using sensitivity analysis and perceived discomfort. This paper only discusses the phase 1 that is development of TAER prototype.

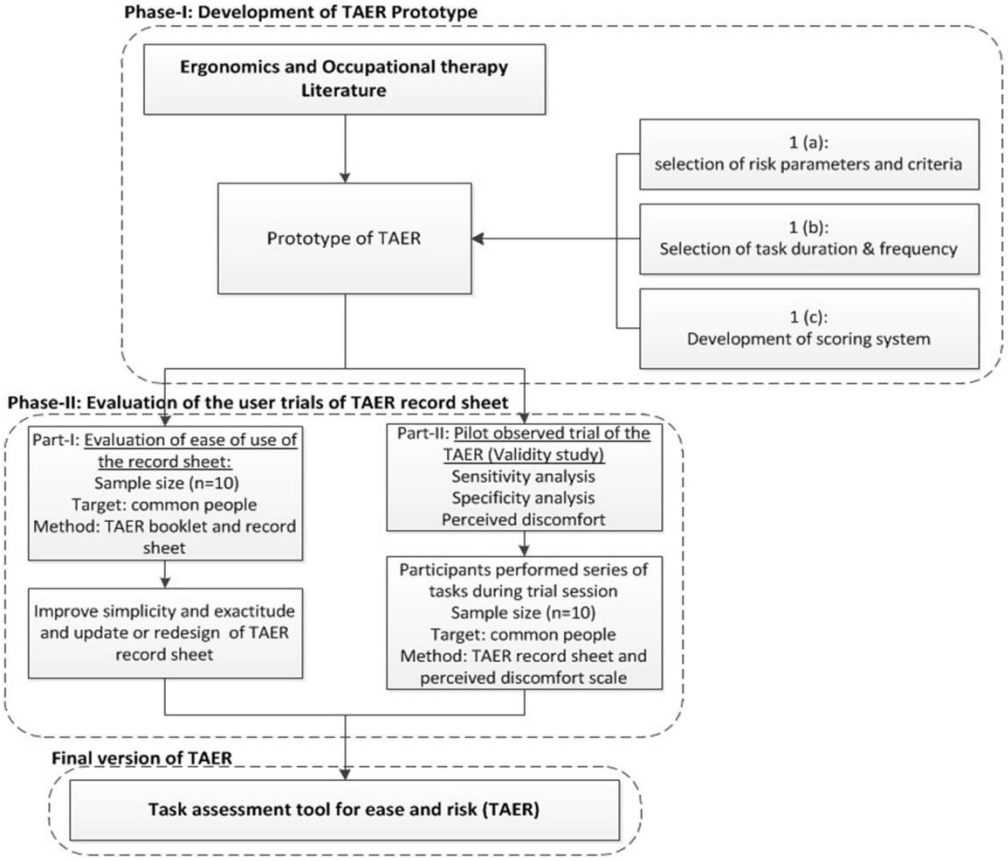

Figure 1 TAER development process.

2.1 Phase-I: Development of TAER prototype

The development process of TAER occurred from an extensive review of the ergonomics literature. The development of TAER prototype is based on three things, which are identification of risk parameters, selection of task duration and frequency and development of scoring system. Three risk parameters have been identified by using the brainstorming session which led to develop mind maps about the performed tasks and conclude that there is a need of assessment tool which must quantify the risk in home environment with respect to the parameters which are (1) Psychological perception of the task (perceived physical demand and complexity of a task), (2) Physical demand (posture adopted) and (3) Manual handling of an objects (lifting/lowering, pushing/pulling and carrying). Task duration and frequency of the task performed is also important to consider because the domestic task is infrequent and last for interval period of time. Therefore, frequency multiplier (the frequency at which the person repeats the task in a week) and duration multiplier (the actual time spent by the person in performing the task) is incorporated in final risk exposure score.

The TAER is aimed at self-assessment; therefore, it is simple, robust, quick and universal for use with home environment tasks. The initial idea or design concept for this assessment tool is similar to the ergonomics tool which was developed by the Ergonomics Centre of North Carolina, in 2012 (The Ergonomics Centre of North Carolina, 2012). As TAER is for ordinary people, it is easy to employ with the different tasks performed in the home environment and can quantify the risk associated with them. This assessment tool used a traffic light system (Health and Safety Executive, 2011) to distinguish the level of risk (green represents low,

yellow is for moderate and red represents high) and assign numeric numbers (1, 2 and 3) for the respective risk levels. TAER consists of single page of record sheet (see figure 2) and booklet (see appendix 1) which shows the step by step guide and original tasks list, which is used for evaluating the risk level for the particular task for each person.

3.0 Result and Discussion

3.1 Development of Task Assessment Tool for Ease and Risk (TAER)

TAER was developed to provide a self-assessment method of screening the domestic tasks for exposure of psychological and physical risk factors associated with the performance of daily tasks. The development of TAER prototype includes selection of risks parameters and criteria, task duration and frequency and scoring system which guide the individual to the level of risk associated with the tasks performed.

3.2 Step 1 (a): Development of parameters and criteria

3.2.1 Psychological perception of the task

Table 1: Risk levels and subjective categories of perceived physical demand required

1	2	3
None (OR) Minor	Moderate	Too much

Table 2: Risks levels and subjective categories of perceived complexity of a task

1	2	3
Not at all (OR) Slightly	Moderately	Extremely

The psychological perception of the task is important to consider because a person's mental state might means that they under or overestimate the risk and this would influence their ability to perform the task. According to the US Department of Health and Human Services, mental health and some psychological factors such as anxiety and depression also contribute to pain especially in the lower back region (U.S. Department of Health and Human Services, 2014). The psychological perception of the performance of the task is a subjective experience and the discomfort involved in the task might interfere with a person's ability to cope with daily activities. It is well known that people have different psychological perceptions of the task they are performing and its severity depends not only upon the situation but also on how they perceive it. So, quantifying the psychological perception risk of a task helps a person to function more effectively in their daily activities. In order to quantifying psychological perception of the task, it is decided to have two parameters which are perceived physical demand and complexity of a task. As these parameters are subjective in nature so, proposed a subjective scales and respective risk levels. Table 1 is used to quantifying the risk associated

with perceived physical demand required. Table 2 is used to quantifying the risk associated with perceived complexity of a task.

3.2.2 Adopted postures

Table 3: Risk levels and non-neutral posture criteria for adopted posture assessment

Body part or joint	Non neutral posture criteria	1	2	3
Head/neck	Observed obvious angle between head and back when performing the task	Head / neck postures is nearly neutral	Head / neck flexed between 10° to 20°	Head / neck flexed more than 20° or extension
Shoulder / arm	Elbow is abducted to chest height and unsupported	Elbow is supported and close to body or flexed 0° to 20° or extended 0° to -20°	Elbow is abducted and flexed / extended between 20° to 45°	Elbow is fully abducted and flexed / extended greater than 45°
Back	Back is flexed more than 20°	Almost neutral posture is observed (or) back is flexed between 0° to 20°	Back is flexed between 20° to 60°	Back is flexed more than 60°
Wrist	Observed noticeable wrist angle	Almost neutral or straight position	Flexed / extended between 0° to 15°	Flexed / extended more than 15°
Leg	Both legs are supported and balanced in both a standing and sitting position	Well supported and balanced (OR) sitting with feet flat on the floor	One or both legs are not supported (minor flexion) or balanced	Legs are not supported and are bent from the knees (flexion more than 30°)

Source: (Health and Safety Executive, 2011)

Human body postures play a vital role in performing daily activities. Therefore, the aim is to develop the criteria for adopted postures in activities of daily life, using similar criteria to those used in ergonomic tools such as Rapid entire body assessment (REBA) (Hignett & McAtamney, 2000), Rapid upper limb assessment (RULA) (McAtamney & Corlett, 1993) and Postural load on the upper limb (LUBA) (Kee & Karwowski, 2001), which involved a check of non-neutral or awkward postures. In the relevant literature, researchers hypothetically divide the human body in three planes: sagittal, coronal and transverse (Bhattacharya & McGlothlin, 1996; Tayyari & Smith, 2003). These planes help to describe the direction of body motion and location of body structures (Bergmann & Peterson, 2011). In activities of daily life, body movements almost always involve all three planes (Patel, 2005)

and are often complex movements that are not straight up and down, but involve significant rotation and/or side bending. The main idea of this study is to assess the adopted postures by observing the body part movements (for instance, head/neck, arm, wrist and back). Performing a task in a non-neutral posture increases the physical demand required for that task (Zimmermann & Cook, 1999) and the person is susceptible to neck and back pain because the physical demand required for the task is an important risk factor for musculoskeletal disorder (Allread, Wilkins III, Waters, & Marras, 2003; Kerr, 2000). The research done by Li and Buckle in 1999 suggests that researchers and practitioners like to use descriptive words rather than assessment of a particular posture angle (Li & Buckle, 1999), but it might be impractical to measure the posture angles when a person is performing daily tasks. Thus, observation of approximate postural angles of the neck, arm, wrist and back is used to assess particular risk levels, and also to provide example pictures to demonstrate the ease of movement otherwise, when assessing the adopted postures. Table 3 shows the three risk levels and non-neutral posture criteria. In this study, green colour is referred to where an almost neutral posture is present, with the number "1". Similarly, red colour refers to the high level of risk associated with non-neutral postures and is assigned the number "3. The moderate risk level is denoted by yellow colour, with the number "2". The observer records his/her postural risk score in the respective box.

3.2.3 Manual handling

Table 4: Risk levels and manual handling criteria for the assessment of everyday tasks

Manual handling tasks	Manual handling criteria	1	2	3
Lifting/ lowering	Based on load handling	Person handling light load (e.g. < 1 kg)	Person handling moderate load (1 to 5 kg)	Person handling heavy load (e.g. > 5 kg)
Pushing/ pulling	Based on the load which needs to be pushed/pulled	Person pushing/ pulling light load (e.g. < 1 kg)	Person pushing/ pulling moderate load (e.g. 1 to 5 kg)	Person pushing/pul ling heavy load (e.g. >5 kg)
Carrying	Based on the load which needs to be carried	Person carrying light load (e.g. < 1 kg)	Person carrying moderate load (e.g. 1 to 5 kg)	Person carrying heavy load (e.g. >5 kg)

Source: (Health and Safety Executive, 1992; Mital, Nicholson, & Ayoub, 1997)

As well as adopted postures, other factors such as manual handling are also involved in activities of daily living. Manual handling tasks involve lifting/lowering, pushing, pulling and carrying (Health and Safety Executive, 1992; Mital, et al., 1997). In everyday activities at home person is involved in tasks such as lifting a laundry bag, lifting/carrying child, emptying bins, or carrying shopping bags. These tasks require more consideration and caution when performed because improper lifting/lowering, pushing/pulling and carrying increase the likelihood of injuries such as lower back pain (NHS Choices, 2015; U.S. Department of

Health and Human Services, 2014). According to the US Department of Health and Human Services, "men and women are equally affected by low back pain and the first attack of low back pain typically occurs between the ages of 30 and 50 years" (U.S. Department of Health and Human Services, 2014). Thus, it is necessary to quantify the risk associated with manual handling tasks. Table 4 shows the risk levels and manual handling criteria and associated risk levels.

3.3 Step 1(b): Selection of task duration and frequency

Table 5: The duration of task and multiplication factors

Duration of task	Duration Multiplier
Less than 5 min	0.04=((0+5)/2)/60
5 to 15 min	0.17= ((5+15)/2)/60
16 to 25 min	0.34=((16+25)/2)/60
26 to 35 min	0.51=((26+35)/2)/60
36 to 45 min	0.68=((36+45)/2)/60
46 to 60 min	0.88=((46+60)/2)/60
More than 1 hours	1.25=((60+90)/2)/60

The duration and frequency of a task are also important parameters to be considered because the tasks performed in the home environment are entirely different from those in an industrial environment. As known by the ethnography study that daily tasks last for short duration and repeated infrequently (Zaheer, Carre, Yoxall, & Rowson, 2015). The more time spent by a person on performing the specific tasks the more he or she is exposed to risk. As their exposure risk level is based on the duration of the tasks and its performing frequency, it is necessary to develop the multiplier factor to adjust or vary the risk level from person to person. In daily activities each task has a different duration and researchers mention that performing tasks in non-neutral (awkward) postures is associated with pain, even if the task lasts as little as 15 minutes (Keyserling, 1998). Therefore, it is necessary to observe the effect of duration in performing the task. Table 5 shows the duration of task and multiplication factors. For the development of the frequency multiplier, the frequencies considered were once, twice, 3 times and 4-7 times in a week. If any task was performed more than three times a week it was considered as performed every day. Table 6 shows frequency of a task and multiplication factors.

Table 6: The frequency of a task and multiplication factors

Frequency	Frequency Multiplier
Once a week (1/7)	0.1
Twice a week (2/7)	0.3
3 times a week (3/7)	0.43
4 to 7 times a week (7/7)	1

In order to make the selection of the multiplier easier, the frequency and duration tables were combined in the form of a matrix. The table 7 below shows the frequency and duration of a task in order to select a multiplier.

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Table 7: Simplified multiplier table

Duration of task	Frequency per week			
	Once	Twice	3 times	4-7 times
Less than 5 min	0.006	0.01	0.02	0.04
5 – 15 min	0.02	0.05	0.07	0.17
16 – 25 min	0.05	0.1	0.15	0.34
26 – 35 min	0.07	0.15	0.22	0.51
36 – 45 min	0.1	0.2	0.29	0.68
46 – 60 min	0.12	0.26	0.38	0.88
More than 1 hr.	0.18	0.38	0.54	1.25

3.4 Step 1 (c): Development of scoring scheme and risk rating table

TAER provide a straightforward tool that a person could easily use to screen the risks related to daily tasks. The tool uses three basic colours (green, yellow and red) to assign the risk level and also assign numeric numbers (1, 2 and 3) to each risk level for quantifying the risk level. Therefore, a fundamental assumption with this tool is that the risk related to performing daily tasks can be quantified by adding the risk level associated with each parameter. The two other parameters – duration and frequency of the task – introduce the multiplier, which shows an individual's exposure to the task performed. According to Pinder, there will be some other unattributed risks and errors, apart from the quantified risk, as it is not possible to cover all the risks in the tool (Health and Safety Executive, 2011; Pinder, 2002). The scoring scheme mathematically written as:

(1) Task Risk = Total exposure score + unattributed risk + error (Pinder, 2002)

(2) Total Risk core = Risk score of perceived physical demand + risk score of perceived complexity of a task + risk score of adopted postures of neck, Arm, wrist, back and leg + risk score of manual handling tasks (Lifting/lowering, pushing/pulling and carrying)

(3) Exposure score = Total Risk Score X Frequency multiplier X Duration multiplier

3.4.1 Calculation of critical IADL exposure scores for selecting appropriate risk level:

Table 8: Frequency of a task and multiplication factors

Frequency	Frequency Multiplier
Once a week (1/7)	0.14 (Low)
Twice a week (2/7)	0.3 (Moderate)
3 times a week (3/7)	0.43 (Moderate)
4 to 7 times a week (7/7)	1 (High)

In order to calculate the critical exposure score for selecting appropriate risk level, first it is necessary to categorise the frequency and duration of the tasks into three levels, as mentioned (low, moderate and high). Observing the frequency of tasks (Table 6), it can be seen that the frequencies "once a week" and "4 to 7 times a week" are categorised as low and high and those of "twice a week" and "3 times a week" are categorised as moderate (see table 8). Similarly, observing the duration of a task (Table 5), it can be seen that the duration of a task

taking up to 15 minutes is categorised as low while the duration of a task taking more than 45 minutes is categorised as high and the duration of a task lasting between 16 and 45 minutes is moderate (see table 9).

Table 9: The duration of task and multiplication factors

Duration of task	Duration Multiplier
Less than 5 min	0.04 (Low)
5 to 15 min	0.17 (Low)
16 to 25 min	0.34 (Moderate)
26 to 35 min	0.51 (Moderate)
36 to 45 min	0.68 (Moderate)
46 to 60 min	0.88 (High)
More than 1 hours	1.25 (High)

Using a TAER record sheet designed for the purpose, if we rate moderate in all three parameters then the IADL exposure score for the moderate risk level is 1.6 to 5 (16 x 0.3 x 0.34=1.6 and 16 x 0.43 x 0.68= 4.67 ≈ 5). Any number below 1.6 is considered as low and above 5 is considered as high. The table 10 below shows the details about the IADL exposure scores, risk level.

Table 10: TAER risk rating table

IADL Exposure Score	Risk Level	TAER implications about the task
<1.6	Low	Task is easy to perform, but required caution
1.6 to 5	Moderate	Task is not easy to perform, required more consideration
>5	High	Task is hard to perform, further investigation required urgently

TAER is very simple to use and requires no particular user for the assessment. Any person can use this tool to quantify his risk level of a task performed in the home environment. There is no specific age and gender for the uses of this tool, but it is recommended that people between 18-65 years of age use it by themselves and people over 65 and having some medical condition use this tool under the supervision of an observing adult or healthcare personnel. The tool will be used by those users who can easily read and understand the English language and mark or record their risk rating and scores clearly with a pen or pencil. Health care personal can also use this tool to assess the patient who is under consideration in relation to the performance of daily tasks and to identify which is the hardest task for the patient to perform. It is also expected that this tool will assist occupational therapists, ergonomist, physiotherapists and general physicians in creating an inventory of their client's performance of daily tasks, and that it will prove to be a comprehensive and proactive surveillance instrument to enable people to perform their daily tasks effectively and independently.

3.5 Final format of task assessment tool for ease and risk (TAER)

Incorporate all three analytical parameters (psychological perception, adopted posture and manual handling), risk criteria and also add duration and frequency multiplier to obtain the

final format of TAER. As this pro-forma will be used by ordinary people to record their task risk level it is named as "Task Assessment tool for ease and risk (TAER) record sheet". To provide the ease of use to the user, an accompanying booklet for the TAER has been design in order to provide information about TAER and a step by step guide. Therefore, TAER consists of record sheet(s) and the booklet. Figure 2 shows the task assessment tool for ease and risk (TAER) record sheet and the booklet is shown in Appendix 1.

4.0 Conclusion

A self-assessment tool for domestic tasks was developed which named as task assessment tool for ease and risk (TAER). It provides the knowledge to individual about the risk associated with the performance of daily tasks. The designed tool is helpful in the detection of initial warnings for healthy people as well as those undergoing rehabilitation processes as it can easily identify the hardest or difficult tasks to perform. The TAER assessment evaluates the psychological and physical risk factors associated with the tasks and their frequency and duration. The physical risk factor assessment of TAER considered adopted postures by a person during the performance any task, while adopted postures comprising five body parts such as neck, arm, wrist, back and leg, which has been identified as indispensable in performing any task. The assessment of adopted postures is essential because adopted non neutral or awkward postures increase the physical demand required for the tasks and person is susceptible for neck and back pain because physical demand required for the task is significant risk factor for musculoskeletal disorder (Allread, et al., 2003; Kerr, 2000).

It is concluded that TAER would be worthwhile in investigating and understanding the domestic tasks by assessing the psychological and physical risk factors and enumerating the load and risk related to the performance of domestic tasks. It is optimism that designed assessment tool will stimulate the user to adapt the appropriate postures of performing tasks. It is expected that, one can easily calculate its own risk level through TAER, which assist them in selecting the alternative tasks depending on whether the calculated risk level is high or moderate. Moreover, through TAER assessment, a person can prioritize their daily tasks within the known risk level, according to their ability, and this diminishes the stress on their body and can help them to improve their level of independence. It is also expected that the TAER will be helpful for health care professionals (physiotherapist, occupational therapists, general physicians) and ergonomists, who will be able to recommend their patients and client to use this tool as developing the inventory for their daily tasks, so that they can easily point out or identify the tasks which are harder for them to perform and be better able to perform those particular tasks(s). In the end it is probable that the "Task Assessment Tool for Ease and Risk (TAER)" will prove to be an efficient self-assessment tool and will help to enhance the health care professional services by providing this tool to the whole community in order to enable people to maintain their independence and stay in their own home as long as possible. Consequently, this will also help to reduce the financial burden on government officials and enable them to build up a society within the country with fewer issues of dependency. In addition to this the tool could be used remotely as an efficient self-assessment tool on sites such as www.agewelluk.org.uk or NHS direct. Enabling people to understand their tasks through this tool, perform their tasks in an efficient way and enjoy an independent life style at home as long as possible would help people future proof their ageing journey.

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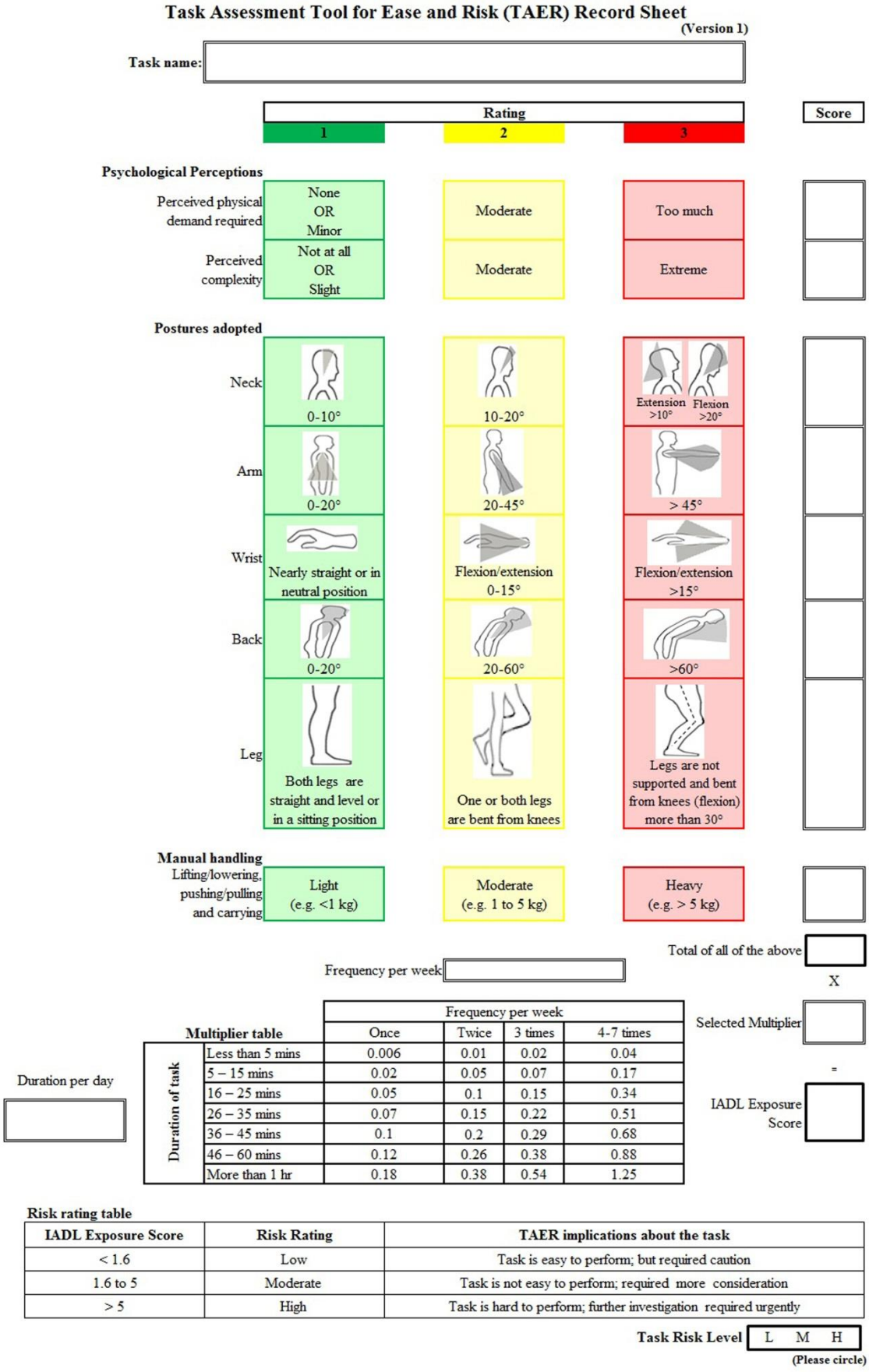

Figure 2 Task assessment tool for ease and risk (TAER) record sheet

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Declaration

The authors declare that there is no conflict of interest regarding publication of this article.

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Appendix 1: Task assessment tool for ease and risk (TAER) Booklet

Task Assessment *Tool for Ease and Risk (TAER) within the Domestic Environment*

The task assessment tool for ease and risk (TAER) evaluates the risk associated with the performance of daily domestic tasks. The tool uses the self-assessment of daily tasks to detect early warnings about habits and behaviour before an injury actually occurs. The tool is based on three risk parameters: the psychological perception of the task, the postures adopted and the manual handling load.

Who can use the TAER?

TAER is simple to employ and any person can benefit from using it to analyse their performed tasks. People of any age and gender can easily use TAER. However, people aged over 65 years may need assistance from another adult or healthcare professional to complete the assessment. It can also be used with a patient who is under observation by healthcare professionals as a means of assessing their performance of instrumental activities of daily living tasks.

What tasks can be assessed?

The design tool specifically covers instrumental activities of daily living (IADL) tasks (see last page) but can also be extended to cover all tasks performed in the home environment. In order to carry out an assessment you will need: this booklet, a record sheet, pen or pencil and clock. It requires little or no training about postures adopted and manual handling of objects during the performance of tasks. The designed record sheet, use through the assessment with simple categories for the postures.

The TAER is capable of assessing the risk level associated with individual tasks; however, it can also be used to assess the domestic load of an individual over time. Assessing weekly tasks using the IADL task list (see page 4) to record every single task can identify the overall domestic load of a person. The tool is helpful to identify those tasks which require caution and might be responsible for the decline in a person's ability. TAER has the ability to compare the current risk levels with previous or future risk levels and quantify changes in ability when activities of daily living are performed repeatedly over time. Through the quantification of risk, the designed tool provides information, which helps a person to prioritize the tasks according to their ability to perform them. The development of TAER plays a vital role in maintaining the person's independence level through preventing and controlling risk because by knowing their own risk level, they can adjust their own environment or habits to reduce the physical effort in performing that task.

Turn over for step by step guide

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Step by Step Guide

1. Select and record the IADL task to be assessed (see IADL tasks list on last page)

2. Record the task duration (time spent to complete the tasks)

3. Record the number of times the task is performed in a typical week

4. Think about your perception of the task and rate the physical demand and complexity using the three-point rating scale

5. For this assessment, think about the postures adopt when carrying out the task. Use the rating scale to record the most extreme posture adopted. By "most extreme" this means most uncomfortable in terms of bending, twisting or reaching, and working with your neck or back bent

6. Consider manual handling (lifting/lowering, pushing/pulling, and carrying) during the task and rate it as light, moderate or heavy

7. Add the scores of each parameter (4, 5 & 6) and record in "total of all of the above box".

8. Select the appropriate frequency and duration multiplier from the multiplier table, e.g. if a task duration is 26 minutes and frequency is 3 times in a week then multiplier is 0.22 (see figure below) and record the multiplier in a respective box.

Frequency: 3 time

Duration: 26

Multiplier table: Duration of task	Frequency per week: Once	Twice	3 times	4-7 times
Less than 5 mins	0.006	0.01	0.02	0.04
5 – 15 mins	0.02	0.05	0.07	0.17
16 – 25 mins	0.05	0.1	0.15	0.34
26 – 35 mins	0.07	0.15	0.22	0.51
36 – 45 mins	0.1	0.2	0.29	0.68
46 – 60 mins	0.12	0.26	0.38	0.88
More than 1 hr	0.18	0.38	0.54	1.25

9. Multiply 7 X 8 and record in IADL exposure score box.

10. Look up the risk rating for the IADL exposure score and record the final result.

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Task assessment tool for ease and risk (TAER) Record Sheet

(Version 1)

1 Task name:

	Rating 1	Rating 2	Rating 3	Score
4 Psychological Perceptions				
Perceived physical demand required	None OR Minor	Moderate	Too much	**4**
Perceived complexity	Not at all OR Slight	Moderate	Extreme	
5 Postures adopted				
Neck	0-10°	10-20°	Extension >10° Flexion >20°	**5**
Arm	0-20°	20-45°	> 45°	
Wrist	Nearly straight or in neutral position	Flexion/extension 0-15°	Flexion/extension >15°	
Back	0-20°	20-60°	>60°	
Leg	Both legs are straight and level or in a sitting position	One or both legs are bent from knees	legs are not supported and bent from knees (flexion) more than 30°	
6 Manual handling				
Lifting/lowering, pushing/pulling	Light (e.g. <1 kg)	Moderate (e.g. 1 to 5 kg)	Heavy (e.g. > 5 kg)	**6**

Total of all of the above **7**

X

3 Frequency per week

2 Duration per day

8 Multiplier table

Duration of task	Frequency per week: Once	Twice	3 times	4-7 times
Less than 5 mins	0.006	0.01	0.02	0.04
5 – 15 mins	0.02	0.05	0.07	0.17
16 – 25 mins	0.05	0.1	0.15	0.34
26 – 35 mins	0.07	0.15	0.22	0.51
36 – 45 mins	0.1	0.2	0.29	0.68
46 – 60 mins	0.12	0.26	0.38	0.88
More than 1 hr	0.18	0.38	0.54	1.25

Selected Multiplier **8**

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IADL Exposure Score **9**

10 Risk rating table

IADL Exposure Score	Risk Rating	TAER implications about the task
< 1.6	Low	Task is easy to perform; but required caution
1.6 to 5	Moderate	Task is not easy to perform; required more consideration
> 5	High	Task is hard to perform; further investigation required urgently

10 Task Risk Level L M H

(Please circle)

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IADL Tasks List

Please select and evaluate risk for the activities which you performed in your daily life:

Please state:
Age:_____
Gender: _____

Basic everyday activities		Total Score	Frequency	Duration in minutes	Selected multiplier	*Exposure score*	*Exposure Risk*
Cooking activities	Food preparation						
	Opening cans						
	Using saucepans						
	Lifting and pouring						
	Washing dishes						
	Drying						
Cleaning activities	Emptying the bins						
	Cleaning kitchen surface						
	Cleaning bathroom						
	Vacuuming						
	Mopping						
	Polishing/Dusting						
	Sweeping						
Laundry tasks	Loading washing machine						
	Setting out clothes to dry						
	Ironing						
	Bed making						
Personal care tasks	Shaving						
	Brushing teeth						
	Washing face						
	Bath/shower						
	Combing hair						
Grocery shopping	Pushing shopping cart						
	Pushing baby pram						
	Carrying shopping bags						
Children activities	Dressing/undressing child						
	Washing child						
	Carrying child						
Gardening Activities	Mowing lawn						
	Planting/weeding						
	Watering						
	Pruning						
Total Score							

Total Activities performed in a typical week		
Sum of all exposure scores		
Domestic load and risk level for typical week		Risk Level L M H

(Please circle)