Background

Multiple sclerosis (MS) is a chronic and persistent neurological condition, with about 2.3 million individuals diagnosed globally [1]. This disease causes major morbidity [2] and mortality in young adults with a 6-7-year shorter life expectancy [3]. Social and psychological factors may predict the incidence of MS or play important roles in the development of this disease regarding their close relationship to its symptoms. In this respect, cognitive impairment, as the patient’s most important determinants of social behaviors, is one of the significant outcomes of MS [4]. Since MS may influence an individual's emotions harmfully, the negative self-concepts replace the positive ones. Such changes are detrimental to the patient's psychological well-being [5].

Psychological well-being, as a subjective concept, is defined differently for different individuals. This concept is a state of mental health, meaning that a healthy person can manage and cope with the pressures of regular daily life in an acceptable way [6]. Psychological well-being consists of two dimensions, namely emotional and cognitive. The cognitive dimension refers to a cognitive assessment of life satisfaction, while the emotional component offers full positive emotions and minimum negative emotions [7]. Psychological well-being refers to the concept of interpersonal relationships and successful outcomes. This is the wellness process leading to a lifelong, permanent, and relatively stable assessment of internal satisfaction [8].

Mindfulness is one of the influential factors in developing psychological well-being and decreasing psychological issues [9]. Mindfulness allows individuals to perceive the fact that although negative emotions can occur, they are not the fixed and permanent parts of their personality [10]. This concept means living at the present
without judging and reflecting on the ongoing events. Moreover, it indicates living the pure truth without reason [11]. In mindfulness meditation, perception is demonstrated as a therapeutic intervention to produce beneficial effects on mental and physical conditions, especially regarding emotional change and recovery from affected psychopathology [12]. In addition, it has been shown that this type of mediation promotes well-being and emotional equilibrium, decreases reactivity to stress [13], and minimizes negative anxiety and depression-related feelings [12]. Emotion regulation is defined as the point of departure towards maintaining, moderating, or changing the emergence, intensifying, or continuing inner feelings. It also refers to emotions related to social, psychological, and physical processes in achieving goals [14]. Regulation of emotions through thoughts and cognitions is unavoidable in human life and helps individuals control their emotions after experiencing stressful events [15]. This aspect is the normal dimension of emotional responses to orientations. According to Granefski and Kraaij, techniques for managing cognitive emotions are acts that deal with stressful conditions or adversities [16]. Emotion regulation plays a central role in the normative transition and its weakness is an important factor in mental disorder incidence. Therefore, theorists believe that individuals who do not manage their emotions properly toward daily internalizing disorders, such as depression and anxiety, manifest more diagnostic symptoms [17]. Based on the results of a meta-analysis study, mindfulness meditation was more effective than control programs in reducing negative affectivity [18]. Oraki and Sami reported that cognitive behavioral intervention based on integrated mindfulness could be introduced as an effective psychological intervention enhancing the indicators of psychological well-being, as well as the quality of life, among patients with MS [19]. The literature review has shown that mindfulness is a good predictor of psychological well-being. Therefore, it can be expected that psychological well-being, being related to the stress level and physical-mental diseases, will be improved as mindfulness increases [20]. The results of research conducted by Senders et al. (2017) have revealed the existence of a remarkable link between pain and attention. Additionally, patients with MS may have a major interaction between pain and attention disorder. This research has highlighted the importance of mindfulness-based intervention in pain management among MS patients [21]. Schirda et al. (2014) showed that mindfulness plays a role in preserving the quality of life of MS patients, influences their quality of life, and is a potential mechanism for regulating emotions [22].

Objectives
To the best of our knowledge, the chronic and disabling nature of MS, the worldwide or regional figures on MS, and the psychological difficulties among patients with MS were taken into consideration less than its physiological related issues. Therefore, the present study aimed to investigate the prediction of psychological well-being based on mindfulness and emotion regulation strategies among individuals with MS.

Materials and Methods
This descriptive-correlative study was conducted on all MS patients with a medical record in Fars Multiple Sclerosis Society affiliated with Shiraz University of Medical Sciences, Iran (n=6000 in 2017). The sample consisted of 80 patients selected by a simple random sampling method based on Cohen's table. After receiving the necessary permissions from Azad University of Shiraz, the researcher was referred to the Fars Multiple Sclerosis Society. To conduct the study, the researcher explained the research procedure to the participants and obtained their verbal satisfaction. Subsequently, the subjects were asked to complete the three questionnaires and were provided with the necessary explanations on how to answer the questions. The participants were provided with the aim of the study, and they embarked on filling out the questionnaires with confidence and accuracy. Furthermore, the participants were informed about the confidentiality of their personal information. The procedure for completing the questionnaires took about 3 months. In the final stage, the obtained information was scored and interpreted. The correlations between variables were calculated using the Pearson correlation coefficient. The collected data were analyzed in AMOS software (version 23) using the multivariable Kurtosis coefficient of the Mardia to identify whether mindfulness or emotion regulation strategies could better predict psychological well-being.

The Scales of Psychological Well-Being
This questionnaire, designed by Ryff, consists of 77 items based on the model and scale of psychological well-being, including six subscales, namely autonomy, environmental mastery, personal growth, purpose in life, positive relations with others, and self-acceptance [23]. In this questionnaire, the items are scored on a five-point Likert scale (1=totally...
agree, 2=agree, 3=no idea, 4=disagree, 5=totally disagree). If the questionnaire scores are < 126, psychological health would be low. The score range of 126-176 suggests an intermediate level of well-being, and those > 176 indicate a high level of well-being. The test-retest reliability coefficient of this instrument was calculated as 0.82. Moreover, the reliability of self-acceptance, positive relation with others, autonomy, environmental mastery, purpose in life, and personal growth subscales were found to be respectively 0.71, 0.77, 0.78, 0.77, 0.70, and 0.78 [24]. In addition, the reliability of the questionnaire was obtained at 0.93 using Cronbach's alpha coefficient method.

The Five Facet Mindfulness Questionnaire
The Five Facet Mindfulness Questionnaire-Short Form (FFMQ-SF), developed by Baer et al., contains a total of 24 items (12 of which were reverse-scored) in five subscales, namely acting with awareness (n=5), describing (n=5), observing (n=4), non-judging of inner experience (n=5), and non-reactivity to inner experience (n=5). The scores of the respondents were rated on a 5-point Likert scale (never or very rarely valid=1 to severely frequently or always true=5). FFMQ subscales were shown to have good internal consistencies rendering a Cronbach's alpha coefficients exceeding the given 0.70 criteria [26-28]. Furthermore, the results of a study performed in Iran to examine the reliability and validity of the mindfulness questionnaire were indicative of a high level of Cronbach's alpha reliability coefficient of FFMQ (α=0.81) [29]. The reliability of the mindfulness questionnaire in the present research was obtained at 0.83 using Cronbach's alpha coefficient. Additionally, the reliability of the subscales of observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience were calculated as 0.72, 0.83, 0.35, 0.45, and 0.84, respectively.

The Emotion Regulation Questionnaire
This questionnaire, developed by Gross and John, includes 10 items with the main goal of measuring emotion regulation strategies. This tool includes reappraisal and suppression as variables [30]. The approach of scoring is based on a seven-point Likert scale (totally agree=1 to totally disagree=7), with the minimum score of 10 and the highest score of 70. The score ranges of 10-27 and 27-40 represent weak emotion regulation and average emotion regulation, respectively. A total score of above 40 indicates strong emotion regulation. In this questionnaire, the internal correlations for reappraisal and suppression were calculated as 0.79 and 0.73, respectively. In Iran, Hasani reported Cronbach's alpha coefficient for reappraisal as 0.79 [31]. In the present study, the reliability of this instrument, using the Cronbach's alpha coefficient, was obtained at 0.46, as well as that for reappraisal and suppression variables being 0.46 and 0.08, respectively.

Results
The study sample consisted of 44% males and 56% females. The mean age of the participants was 49.32 years. The education level of 42%, 36%, and 22% of these subjects was respectively under BA, with a BA, upper BA. Table 1 summarizes the descriptive statistics of the research variables (i.e., central indices, including mean, standard deviation, Kurtosis, and skewness). The results of the descriptive findings of the subscales have revealed that in the components of mindfulness, the highest and lowest mean scores are related to observing and non-judging of inner experience, respectively. This section seeks to answer the main research hypothesis 'Prediction of psychological well-being based on mindfulness

<table>
<thead>
<tr>
<th>Variable</th>
<th>Subscale</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
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<tr>
<td>Mindfulness</td>
<td>observing</td>
<td>220</td>
<td>26.76</td>
<td>5.36</td>
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<td>0.329</td>
</tr>
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<td></td>
<td>describing</td>
<td>220</td>
<td>25.06</td>
<td>6.22</td>
<td>0.03</td>
<td>0.327</td>
</tr>
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<td></td>
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<td>220</td>
<td>23.21</td>
<td>3.70</td>
<td>-0.67</td>
<td>0.327</td>
</tr>
<tr>
<td></td>
<td>non-judging of inner experience</td>
<td>220</td>
<td>21.19</td>
<td>3.34</td>
<td>0.58</td>
<td>0.327</td>
</tr>
<tr>
<td></td>
<td>non-reactivity to inner experience</td>
<td>220</td>
<td>22.12</td>
<td>4.74</td>
<td>0.66</td>
<td>0.327</td>
</tr>
<tr>
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<td>220</td>
<td>25.34</td>
<td>7.71</td>
<td>-0.01</td>
<td>0.327</td>
</tr>
<tr>
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<td>14.31</td>
<td>4.30</td>
<td>0.79</td>
<td>0.327</td>
</tr>
<tr>
<td></td>
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<td>24.46</td>
<td>5.06</td>
<td>0.14</td>
<td>0.327</td>
</tr>
<tr>
<td>Psychological well-being</td>
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<td>22.75</td>
<td>7.41</td>
<td>0.64</td>
<td>0.327</td>
</tr>
<tr>
<td></td>
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<td>57.72</td>
<td>15.01</td>
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<td>0.329</td>
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<tr>
<td></td>
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<td>34.08</td>
<td>9.62</td>
<td>0.66</td>
<td>0.328</td>
</tr>
<tr>
<td></td>
<td>happiness</td>
<td>220</td>
<td>55.36</td>
<td>12.21</td>
<td>0.17</td>
<td>0.327</td>
</tr>
</tbody>
</table>
and emotion regulation strategies among patients with MS.

Structural equation modeling was used in the current study. One of the assumptions of this modeling was the normality of the multivariate distribution. The value of the Mardia coefficient for the present study was calculated as 3.26, indicating that the assumption of multivariate normality was accepted. Since structural equations are based on a linear correlation between variables, the linear correlation matrix between research variables is reported in the following (Table 2).

According to the correlation matrix, the scales of mindfulness and emotion regulation have a positive and significant correlation with psychological well-being (P≤0.01).

The conceptual model of the research is presented in two states, standardized and non-standardized coefficients (figures 1 and 2).

The most important indicators for fitting the conceptual model of research are reported in Table 3. Based on the results of Table 3, it can be concluded that the model has a good fit.

According to the results of Table 4, the direct effect of mindfulness and emotion regulation on

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**Table 2. Correlation matrix between variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mindfulness</th>
<th>Emotion regulation</th>
<th>Psychological well-being</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion regulation</td>
<td>0.63**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Psychological wellbeing</td>
<td>0.57**</td>
<td>0.86**</td>
<td>1</td>
</tr>
</tbody>
</table>

*P<0.05, **P<0.01

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**Figure 1. None-standardized coefficient model**

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**Figure 2. Standardized coefficient model**
the psychological well-being components were significant (P<0.01).

**Discussion**

The results of this study showed that the mechanisms for regulating mindfulness and emotion are significantly related to psychological well-being and can significantly predict it in different dimensions. Regarding this, individuals can enhance their psychological well-being by increasing their responsiveness and improving their emotion regulation processes. This finding is consistent with those of other studies, including Harmon-Jones et al. [7], Western and Tomaszewski [8], Roberto et al. [9], Valim et al. [10], and Khusid and Vythilingam [12].

The dimensions, such as observing, describing, acting, and suppression, can predict the personal growth of patients with MS. It is important to note that subjective observing skill has to reach the describing skill through concentration on occurring events. Indeed, by practicing mindfulness, one can improve different subscales of this variable, including observing, describing, and acting. Accordingly, enhancement in observing and describing skills leads to sound decision-making and better acting [32].

As the results imply, observing, describing, acting, and non-reactivity can significantly predict self-acceptance [33, 34]. Therefore, sound observing, accurate describing, and logical acting based on the observing and describing, as well as emotional non-reactivity to the conditions, imply following mental awareness and accurate emotion regulation procedures [34]. Based on the results, the variables of observing, describing, non-reactivity, and reappraisal are significant predictors of the positive relationships among the other variables [34, 35].

It can be argued that observing, event reviewing, and sound describing of the events and communications, as well as undesirable and emotional non-reactivity, give an individual adequate time to control emotions and self-control if integrated with a reappraisal of the events and thinking more of the issues since the individual is detached from the problems. As a result, these factors can make individuals think about how to build relationships with others, irrespective of emotional and unfavorable conditions. The consequences of this approach would be the improvement of decision-making in personal and collective relations, leading individuals to positive relationships with others disregarding the emotional and intensive encounters [35].

According to the findings of this study, it is implied that observing, no-reactivity, reappraisal, and suppression can predict life satisfaction among patients with MS [33-35]. A large body of research indicates that mindfulness enhancement leads to psychological well-being improvement, which in turn, increases life satisfaction. In this respect, it is noteworthy to say that the improvement of subjective observing, as well as the desirable perception of subjective events, improve the person's logical acting along with emotional non-reactivity to the problems leading to the decline in daily life tensions. Consequently, such patients gain the skills to make better decisions regarding the problems in which they are involved, leading to obtaining more desirable results. The results of such changes would be life satisfaction among such patients and equipping them with desirable emotions, raised awareness, and a positive attitude towards life [36].

Considering the results, observing, describing, non-judging, non-reactivity, and suppression can significantly predict spirituality. It should be noted that not only the patients' mindfulness skills would enhance but also they are detached from stressful situations and anxiety; therefore, a positive attitude is achieved towards the events. As a result, the individuals' spiritual, internal satisfaction, and consequently their inner spirituality, would increase

<table>
<thead>
<tr>
<th>Table 3. Model fit indicators</th>
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<tbody>
<tr>
<td>Indicator</td>
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<tr>
<td>χ²/df</td>
</tr>
<tr>
<td>RMSEA</td>
</tr>
<tr>
<td>CFI</td>
</tr>
<tr>
<td>NFI</td>
</tr>
<tr>
<td>GFI</td>
</tr>
<tr>
<td>AGFI</td>
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</table>

1. RMSEA: Root Mean Square Error Approximation 2. CFI: Comparative Fit Index, 3. NFI: Normed Fit Index, 4. GFI: Goodness of Fit Index, 5. AGFI: Adjusted Goodness of Fit Index

<table>
<thead>
<tr>
<th>Table 4. Effect of emotion regulation and mindfulness on psychological well-being</th>
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<tbody>
<tr>
<td>Hypothesis</td>
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<tr>
<td>Mindfulness → Psychological well-being</td>
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<tr>
<td>Emotion regulation → Psychological well-being</td>
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</table>
It was found out that observing, describing, and acting can predict the pleasure and optimism among the patients with MS [31-34]. Pleasure and optimism refer to overcoming negative emotions with positive ones and making more optimistic decisions. It seems that optimism is mostly related to the cognitive aspects of psychological life rather than to the emotional aspects [36]. It can be concluded that observing subjective events from a better point of view leads to accurate describing, resulting in individuals’ better performance under instantaneous conditions and gaining a feeling of satisfaction with their performance and present conditions. This satisfaction creates a positive feeling and leads to pleasure and optimism. The present study has several limitations restricting the generalization of the results to varying degrees. Although the sample size was higher than most, if not all, studies conducted on investigating mindfulness in the MS area, it was still relatively small. Therefore, the results of this study cannot be generalized. In this regard, it is recommended that these variables be examined in other cities as well. The other limitation was related to the research tools as self-report questionnaires influencing the findings as a result. The authors have suggested that patients with MS be trained regarding emotional control and counseling to reduce their mental distress. Furthermore, it is recommended that such patients be taught about mindfulness to improve the dimensions of their psychological well-being.

Conclusions
Training mindfulness and emotion regulation strategies are applicable for patients with MS with the purpose of improving psychological well-being components in their lives. Future researchers are recommended to investigate these variables on other patients with other diseases. It is also suggested to apply the experimental research designs to promote psychological well-being.

Compliance with ethical guidelines
The present study was extracted from a Ph.D. thesis dissertation of the general psychology submitted to the Islamic Azad University, Shiraz. This research was approved by the Ethics Committee of the Islamic Azad University, Shiraz (IRJAUTONREC.1396.152).

Acknowledgments
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Authors’ contributions
KD and SB developed and designed the study, analyzed the data, prepared figures and/or tables, and wrote the paper. KD developed and designed the experiments, reviewed paper drafts, monitored the whole process of the study, and contributed to the reagents/materials/analysis tools.

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Conflicts of Interest
The authors declare that there is no conflict of interest.

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